TIsHUG News Digest

TIsHUG News Digest   ISSN 0819-1984

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Membership and Subscriptions

Annual Family Dues $25.00
Overseas Airmail Dues   AUS$50.00

TIsHUG Sydney Meeting

The next meeting will be at approximately 1.30pm on 1st of April at the Woodstock Community Centre, Church Street, Burwood.

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Index

They're off

by Geoff Trott

As you will have observed, we have a different format this month. This is because we have run out of the paste up sheets that we inherited from Shane and have decided to try something different. We are now basically pasting up on blank sheets using guides to get it all straight and pasting on the page numbers at the end. In this way we may be able to get the final result a bit larger (less reduction) with the same or marginally more information on each page. We can also put the page numbers on the outside of each page as was requested by someone (was it Craig?). We hope you will like it and if we receive no adverse comment we will assume that all are happy. Of course you could tell us that you do like it!

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Somewhere in the issue we have started a Bug Report for reporting on known bugs in often used programs. If you know of some bugs, particularly if there are known fixes, please let us all in on the secrets. I have a formatting error to report from March TND on page 26 in the article on a TI-Writer Bug. Unless I am careful when editing BASIC programs the formatter changes & to do an underline of the next characters until the next space. Thus we printed "DSK"F$(J),UPDATE instead of "DSK"&F$(J),UPDATE. Other problems are the losing of * and the following 2 numerical digits (A6 instead of A*256) and the changing of the exponentiation symbol to a space (A 2 instead of A^2). In assembly language programs the @ causes the following characters to be emphasised until the next space. If you see strange underlines and emphasised in programs you will know this editor has been a bit careless.

Co-ordinator's Report

by Dick Warburton

Well we have had our first monthly meeting of the new year. We have made a few changes including free tea and coffee. Part of the meeting was devoted to looking for ways to publicize the club, and some imaginative ideas were raised. A brief survey of the members present was taken to establish what members are willing to help the club this year. An encouraging number volunteered their willingness to help in some way. I will be contacting as many as I can to work out ways to get things moving. Some very clear trends emerged from this short survey.

1. 34/38 members expressed a desire to attend an interest group. The first one, on TI-Artist has already planned its next meeting.

2. 12 people volunteered to help with the shop in some way.

3. 22 members displayed an interest in recruiting new members and/or publicising the club.

4. Another 15 members expressed an interest in reviewing new products.

5. However the real surprise was the number who showed an interest in being willing to learn to repair consoles, or in helping on technical days. Almost all who attended, expressed an interest in either one.

The survey on the shop was also of interest. Not surprisingly, almost everyone wanted TI99/4A Software and Diskettes, but only 7 people showed any interest in other disk types. However, the surprise again was that almost everyone surveyed liked the idea of selling members' hardware through the shop. Club auctions or swap days were also fancied. It seems from this small survey that a significant proportion of our members are growing more interested, (myself included), in the technical aspects of the TI99/4A. It would therefore seem to be sensible to direct more of our energies to meet this apparent need. Other areas well supported on the survey included expansion hardware items, and memory chips. As I suspected, a sizable minority are interested in buying PC Public Domain Software. As we already have low cost supply sources, this could well be another avenue of extra income for TI99/4A club members.

We will continue to improve monthly meetings so they reflect what you want. If they do not then please tell us so very plainly. Craig has some great ideas for the future. We would like to present demonstrations and activities which appeal to a greater number. We also want to cater for those whose interests are more advanced. Hopefully we will have more consoles and systems available, and a numberof smaller groups set up. You might like to bring your system along; we will find a use for it.

The monthly directors' meeting was held after the main meeting, and it was rather hurried. Some of the more interesting items discussed were:

1. The club is presently negotiating to market Jim Peterson's Software at reasonable prices.

2. The B.B.S. report was read and the budget for 1989 was passed.

3. The possibility of a TI-Faire being held in Sydney late in 1989 was discussed. The outcome depends on whether it will clash with the plans of other clubs. If it does eventuate, it will be a very exciting time for all of us. A suitable venue is available.

4. The club is hoping to sell a professional tape copying machine, because it has no further use for it. (Any possible buyers out there?)

5. Fees for 1989 will remain the same. Hopefully, other activities will bring sufficient income to subsidise the increased costs.

6. The idea of special interest groups is supported by the directors.

7. A software competition is being considered, but the details have yet to be worked out.

Finally, I would like to suggest one particular interest group. How about a group which meets regularly to learn to fix dead consoles, and learn more about the hardware side of the TI99/4A. I have already found a good location if people are interested. Let me know if you would like to be included. You can ring me after hours on (02)918 8132.

I am feeling more and more confident about 1989. It is looking good. See you at the next meeting. o

Public Domain Releases

by Larry Saunders

MOUSE1 – 27–Nov–88
   This is a mouse version of John Johnson's MENU program.
C99LIB – 06–Nov–88
   c99 object library/header files for use with LDR v3.1.MDOS only Part of c99, Fairware from Clint Pulley.
LOADER, V3.1 – 06–Nov–88
   The updated version of QDL below. Includes the ability to search object libraries. For M-DOS, c99 or Assembler, From Clint Pulley.
SINE DEMO – 03–Nov–88
   A little demonstration program for MDOS which plots a color sine wave on the screen in graphics mode 7. An example of the upcoming 9640 FORTRAN package. By Al Beard and LGMA Products.
SECTOR EDITOR – 03–Nov–88
   A file sector editor which runs under MDOS. By LGMA Products.
FRACTALS – 03–Nov–88
   A fractals demonstration in 9640 FORTRAN by Al Beard.

BUD MILLS releases PEB cartridge card
   Bud Mills Services (16 Dartmouth Dr., maker of the popular Horizon RAMdisk has announced the P-GRAM card. This remarkable device allows you to do what many people have wanted to do for years; put their most commonly used cartridges in the Peripheral Expansion Box and off their desks. The P-GRAM card comes with 72K of battery backed memory (along with 72K of non-battery backed memory for use with other applications), where you can put such popular cartridges as Super Extended BASIC, Multiplan and Editor Assembler module all in one place, accessible from one single menu.The card includes software to vacuum out the modules to disk, as well as software to load the saved modules into the card. Technical users will note that the card allows them to modify saved modules, and screen the operating system of the TI99/4A to their hearts content. This card also optionally includes a clock for use with software that can utilize it (Telco, and some BBS software mainly). This device will make the TI99/4A a much more pleasurable experience. This item I have on order and will demonstration when it arrives (takes six weeks or more to get it from Bud Mills by air mail both ways. Ordered Jan 89

TIsHUG Software Column by Terry Phillips

I must admit that in my haste to prepare items for the last newsdigest, I omitted to state what would be available on disk and tape at the March meeting. I did hand out a sheet for those who attended, but here is a summary of what was released:

DISK A302 - contains 11 pictures of Spectrum game screens. The main display program was written by Tonny Brouwer and is distributed as Fairware. This disk also contains a CONVERTOR program which enables the changing of the pictures from their present format to TI-ARTIST format. Picture titles on the disk are COOKIE, MUGSY, AD ASTRA, JACK AND THE BEANSTALK, COMBAT ZONE, CHEQUERED FLAG, MR WIMPY, THE HOBBIT, HARRIER ATTACK, AUTO MANIA and PYJAMARAMA. 342 sectors and requires Extended BASIC, 32K expansion and a disk drive.

DISK A304 - 12 more pictures. Titles are BOMB JACK, COBRA, COMMANDO, SPITFIRE, ASTERIX, SLAP FIGHT, HYDROFOOL, WONDER BOY, THE HULK, THE MAGIC LAND, JETPAC and SCUBA DIVE. 357 sectors.

DISK A305 - another 12 pictures. HORACE AND THE SPIDERS, NIGHTSHADE, SPY HUNTER, BRUCE LEE, SABOTEUR, SUPER TEST, ODIN, STRIP POKER, MOLECULE MAN, GLADIATOR, RAMBO plus an un-named picture. 347 sectors.

DISK A306 - the great FIDDLER ON THE ROOF musical program. Disk contains 2 versions, the original BASIC version and a new high speed loading version.

TAPE 1989/01 - this tape contains some assembly games which recently appeared on the BBS. These are all imbedded Extended BASIC and require 32K expansion. Titles are CANNONBALL, COMPU-CAR, ET AT SEA, ANGLER DANGLER, MATH CATCHER, MISSION X and TI MAZOGZ.

TI-Base update:

Version 2.01 was received late February, and I have already exchanged a number of disks for members who purchased Version 2.0 and earlier. If you still require the upgrade disk then see me at the meetings. I am still holding updated documentation to version 2.0 for member Ken Trotman. If at next meeting Ken, please see me. I am also holding copies of TI-Artist for members C Gudgeon and A Lynn.

Disks Received:

A number of disks have recently been received from overseas and from John Paine, who donated some disks to the club software library. I am still going through all these disks and will have them placed in the the library shortly. One of the disks contains files on the contents of the LA99'ers library and I will make copies of this available at the next meeting. The LA99'ers will supply disks for the cost of US$2 plus .90 cents mailing and handling. They seem to have a great deal of software and their catalog is well worth taking a look at. Also available will be Jim Peterson's public domain catalog. Have a look at this one also if you are after some really good software. Speaking of Jim Peterson, the Directors decided at the last meeting to take up Jim's offer and to handle his range of software through our shop. Jim has 3 great disks which he calls NUTS & BOLTS, which contain great routines in merge format. These will be priced at $15 each. Also available will be Jim's 5 Tips From the Tigercub at $10 each and his Full Collection Disks (18 in all) at $5 each. As you all know, Jim has been a prolific supporter of our computer for many years, so now you have a chance to repay some of that support and get some marvellous software into the bargain. If not ready by the April meeting then certainly we should have all this software by the May meeting.

Nothing much more to report at this time but will close with the reminder that if you want something from the software library please get in touch with me. o

Secretary's Notebook

by Terry Phillips

It was nice to see a good turn-out for the March meeting. I counted around 60 people present and we may have had more come along if not for the rainy day. I hope you all liked the new meeting format and the opportunity to take a coffee break mid afternoon. Some very special events are planned over the forthcoming months, so if possible, do not miss them. In particular, the June full day workshop looks like being a beauty. The whole of Woodstock has been booked, so we will have plenty of room to spread out.

We have 2 new members to welcome and they are:

Neal Negal - North Ryde
W P Kanitz - Barrack Heights

Neal was at the last meeting, where he was telling me that he had only recently taken up computing after being introduced to the TI99/4A by his bowls friend, Alf Culloden. Good one Alf, how many more members out there would like to introduce a new members?

At the last Directors' meeting it was agreed that this group should look seriously at holding a TI-Faire later this year, probably either October or November. I have sent letters to all Intra and Interstate groups seeking their support and am now waiting on replies. Should this event go ahead, it will take a great deal of planning and organising with a volunteer committee being needed to steer it to fulfilment. Please give it some thought. Would you like to assist?

This file goes on both the Bulletin Board and is published in the newsdigest. By the time you read it in the newsdigest it will be nearly the end of March. The majority of memberships expire at the end of April, so now is the time to prepare to renew your subscription. If you are unsure when your membership expires, have a look at your mailing label. The date of expiry will be clearly shown on the first line. Let us keep our group alive in 1989; renew now.

Here is a rundown on future meeting activities:

April 1 Normal meeting with an approximate 1.30pm start

Due to there being a delay in the release of Press, Larry will not be able to give his demonstration at this meeting. Main topics will now centre on both PRBase and TI-Base, 2 excellent data base managers. If you are struggling with either then come along and find out all about them. As usual the shop facility will be available during the afternoon and there will also be a coffee/tea break.

May 6 Normal meeting with an approximate 1.30pm start

The band of volunteers who have the responsibility of organising meeting subjects are hard at work coming up with ideas. At this stage it is hoped to have the benefit of George Meldrum's knowledge with his fast tape loading program.

June 3 Full day tutorial workshop day with a start at 10am

This will be a big day with lots of planned activities. In line at the moment are Extended BASIC for beginners and intermediates, how to use various items of software, hardware projects and software copying. More details will be published as we near the big day. o

Letter to the Editor

Dear Geoff,

On the 1st May Sara and I are off to the West Coast of USA for a few weeks. We have arranged to visit John D Johnson of San Diego TI99ers, who in turn has introduced us to Terrie Masters the mainstay of LA99'ers Computer Group. Should any of Illawarra group know any members of either group I would deem it a pleasure to convey their regards.

Your comments "Perhaps the next Editor of the TND will be in Brisbane!" has hit the nail with laser beam accuracy. I have all ready sown the seed with my correspondence to LA. We plan discussions on similar lines at my meeting with their groups. There is no doubt in my mind that the way to go is for the stronger group to publish for the weaker, albeit retaining a section for each topical, parochial interest.

Working on the almost unfounded theory that the average association is less than a dozen members. TIsHUG gets 50 out of 300 at its AGM. Banana Coast gets 6. We have 8 Regional Groups and Sydney City. Probably averaging less than 12. How may of these "96" members really do their bit? All this means that the more we can spread the load the better the product. I dread the thought that I slave over the typewriter to produce an item of interest only to find that it is already available on disk for the asking. Very little of my typing is old hat to us all. The Newsletters we receive from overseas are in the main of a similar pattern. The practical content priceless and evergreen.

The basis of my scheme is to send each month on disk all items that have been typed or downloaded in exchange for similar items from participating Groups. The Editor's job would then be to scan the discs for items that are the flavour of the moment and put them to paper. That information would be circulated on disk to weaker groups to maintain a high standard throughout the TI99/4A community.

Take our BC group isolated as we are, the only contact would be the TND. However we are privileged to have keen members each of whom are members of two groups. These come from Sydney, Brisbane, Hunter Valley, Genial Traveller and soon LA and San Diego.

Whilst I am on the subject of disk swapping may I add that I would like to see a "chain letter style disk" be set in motion containing any pet, favourite, unusual, old, cute, odd, stolen or legitimate "fairware" programs. The scene may be BC sends to you a disk SSSD contents one or more quality programs selected by our Banana Coast group (LOTTO_SCAN) with instructions to pass it on to Peter Gleed (Melbourne). After your group have made copies and added their contribution, you then pass it on to Peter telling him to pass it on to "another responsible person known to you" say Fred Cugley of Adelaide. The sender always knows the names of the two subsequent recipients of the disk, assuring some control over the location of the disk should a trace become necessary for any reason.

Now, when the disk is full it must be returned to the originator. There is every reason for all groups to send two or more initial disks to encourage member participation in disk swapping .

Yes Geoff, you are the first to receive a disk with instructions to forward it on to Fred. Let us hope that it will boomerang soon. I have taken the liberty of calling the disk BOOMERANG1.

The cost to operate this community effort is a service to your fellow TI99/4A orphans and a donation to Australia Post!
Yours in support, John Ryan

Dear Sir,
It is the start of a new year, a new board of directors, new ideas and new ways of doing things. Or is it?

With each new year comes the cry, "what are the directors going to do about the club membership?". Well, that is just fine, or is it? What about YOU, yes YOU! What are YOU going to do about the OUR club membership?

It is so easy for the masses to sit back and point the finger at the few, saying "take care of it". Well hey, there are more of us than there is of them (the directors), so why do not we take care of the problem. Let me put it to you this way, how many of you know of a TI99/4A owner who is not in the club? If you do know of someone then why have not you encouraged them to join? Who else is in a better position to explain and demonstrate, at length, the benefits of club membership. With the advancements and quality in both hardware and software, a club membership keeps you up to date and gives you access to all that is available for the TI99/4A. The benefits of membership are many. After all, you think it is worthwhile to be a member. Or are they using you, through your membership, to get what they need, without paying any membership themselves? If the latter is the case, then they obviously see value in the club, so convince them to do the right thing and join. Remind them that if the club collapses, then where will they get their hardware and software.

If a club is to survive then it is up to all its members to go out and promote their club. So as some would say "get out there and sell, sell, sell!"
Name withheld

Author asks all newsletters to reprint these letters.

Dear Sir,
I wish to bring up the subject of regional groups, but first let me "Thank you" to those people who host them. I am sure your time, effort and sacrifice is appreciated by all those who attend (I do).

The regional meetings are both a social event and chance to see and hear of things that are going on with the TI99/4A. Sometimes they can be a little disorderly (but always well behaved?). Topics or activities should be worked out in advance of each meeting, then adhered to at the time of the appropriate meeting (where possible). I have been hearing people say that they would like to have meetings demonstrating "this or that" feeling left out because they do not. Why? Possibly because they do not speak up (no one should bite your head off, you did join the club to get help) or no one listens (they should, after all, everything is new and interesting to a new member and we want and need new members).

The meeting. This is the time when the regional co-ordinator must show leadership, bringing the meeting to order so that the nominated activity may proceed.
Name withheld   o

For Sale

The club is selling its COPYETTE 1&3 Professional high speed cassette copier. This will produce 3 copies at once from a C60 master in about 2 minutes. It is ideal for large volume duplication of speeches, lectures, etc. It has had very little use as it is monaural and so is not suitable for stereo music nor for computer programs. Ask around at your local school and service groups to see if they may have a need for such a device. The club bought it for $1200 a few years ago and would like about $450 for it or best offer. For more information phone Rolf on (02)692 5754 at work or (042)84 2980 until 10pm after hours.   o

Sending Mail
on the TEXPAC BBS

by Ross Mudie, SYSOP

A TEXPAC BBS user can send electronic mail to another user by selecting Main Menu option 3. The mail is addressed to User Names which appear in the list on the file BBS_USERS.

The mail may be sent manually, direct from the user's keyboard or from a previously prepared DIS/VAR 80 text file. There is an Extended BASIC program in the program download menu which will allow mail to be sent from a disk file. The program is named SENDMAIL4.

SENDING MAIL.
Enter the mail option using 3 from the main menu, the BBS will advise how many sectors are free on the mail disk. If you are sending a file ensure that your file is smaller than the free space.

After you enter the addressee user name, the BBS will validate your entry and a file will be opened for the addressee in the "append" mode. This means that if there is already other mail for your addressee then your mail will be added on to the end of the existing file. You will then receive the same date and time stamped header as is placed on the addressee's file and the > prompt will then be received. After the > is received you may proceed to send your electronic mail from your keyboard or disk file.

SENDING FROM THE KEYBOARD.
Upper and lower case may be used in addition to numbers and symbols. Commas and quotes, (once a no no on this BBS), may be used freely.

If you make a mistake then CRTL[H] will back space in the same line, wiping out all that you back space over. If FAST-TERM is in use then FCTN[1] and FCTN[S] will also perform a destructive back space.

Check that the line you have typed is correct before pressing <ENTER>. Once <ENTER> is pressed the line of text is placed automatically in the disk buffer before the > prompt is received again.

Lines of mail may be up to 80 characters in length, a warning bell sounding at 72 characters. Any characters typed after the 80th in a line will be lost.

If you want to enter a blank line then press the space bar at the start of the line then press <ENTER>.

To exit mail press <ENTER> at the start of a new line and you will be prompted:
[C]ontinue or just ENTER.
C will let you continue where you left off, whilst just <ENTER> or any other key + <ENTER> will finish saving the file to disk and close the file.

The word END on its own in upper case at the start of a line will no longer exit to the [C]ontinue or just ENTER prompt as it used to do.

SENDING A FILE TO MAIL.
This is best done using a cartridge expander with TE2 and Extended BASIC plugged in. Save your SENDMAIL4 program on the disk under the name LOAD. Using TE2 tell the BBS who the mail is for and wait for the > prompt after validation and header. Exit TE2 with CRTL[O] (to close any open disk files) and switch to Extended BASIC. Load and run the SENDMAIL4 program which then prompts for the file name to be sent.

It is not practical to use a program in console BASIC since commas and quotes can not be used in text with INPUT.

After entering the file name and specifying to which RS232 the modem is connected the SENDMAIL4 program will show you what is being sent. On completion exit with BYE and switch back to TE2.

When back in terminal mode press <ENTER> once only and the [C]ontinue or just ENTER prompt will be received.

If you want to experiment with sending mail then address your test mail to yourself. You can then read the test mail without having to hang up and call again by simply pressing 9 when in the main menu. This special feature, allows you to log on again. After giving your user # and password you will immediately receive your own test mail.

Please consider the needs of other users and refrain from completely filling the mail disk if the free space is small.

RECEIVING MAIL, THE WHOOPS FUNCTION.
If you receive mail but do not manage to capture it on your printer or disk, or just want to make sure you have saved it successfully before it is deleted, then at the end of the mail when you receive the prompt:
[Save] or [D]elete your mail >
press S then <ENTER>. After checking use 9 from the main menu to log on again for another go and when all is OK allow deletion of the mail by just pressing D <ENTER> at the prompt. You do not have to read the whole mail file as pressing E will take you to the [S]ave or [D]elete your mail > prompt.

Please remember that uncleared mail causes unnecessary congestion on the mail disk.

If, for some obscure reason, you want some of your own mail to another user deleted, then the only way is to leave E-Mail for the SYSOP stating the date that the mail was sent and the addressee user name. Please note that this is a particularly time consuming process for the SYSOP and should only be requested as a last resort.

PROBLEMS SENDING 'WRITER FILES.
If you prepare your files with TI, TK, BA or FUNNEL-Writer then the control characters will drop you out of the mail routine if you use the old SENDMAIL3 program. The SENDMAIL4 program will automatically remove one byte strings which contain only a carriage return.

SENDING RLE FILES.
The BBS will now accept most RLE image files which are DIS/VAR 80 format. Characters in the range >16 to >7F will be received, stored and transmitted by the BBS in the MAIL routines. If an attempt is made to receive a RLE file with TEII the terminal emulator will cease to update the screen and it may be necessary to QUIT TEII and start again. There is usually no need to set up a new call to the BBS in this case.

For more information on the transmission of RLE files contact Arto Heino, user name ARTY on this BBS.

And that's how Extended BASIC treats assembly files. In the next article I will take a look at writing simple assembly routines which would be executed from Extended BASIC. If you are already writing assembly routines for Extended BASIC and have questions you would like answers to, do not hesitate to call me at (613)745 4618. (Continued in part 2).

Note from Ross Mudie...
Assistance in TIsHUG is available from a number of members and Regional groups. You may contact Ross Mudie, Shane Ferrett, Craig Sheehan (Northern), Geoff Trott or George Meldrum (Illawarra) just to name a few members who will be able to help. Refer also to Ross Mudie's Link-it articles and Craig Sheehan's XDP series.

From the Bulletin Board

MAIL TO : ALL
MAIL FROM : LARRY

Phoned over to Asgard Software today at 10.30 am 25th February 1989 to check on Press and other programs. All programs but Press will be sent early next week, but Press will take (estimate only from Asgard) 2 weeks to 10 weeks or maybe more before it will be ready to ship. Asgard is shipping by air mail next week; Batch-it, Typewriter, Beyond Video Chess, PrEditor update, Tod-Editor, The Adventure Guide, Legends II: The Sequel; and about one to two weeks later, Oliver Twist, Old Dark Caves: The lower caverns, Artist Instance volumes #1, #2, #3, #4, #5, #6, #7, #8, #9, Artist Enlager and Font Writer II.

MAIL TO : ALL
MAIL FROM : HEADSPIN

Hi there Everybody,
I am sad to say that the time has come to part with the good old TI99/4A.
What I have to sell is as follows:
A console with all cables, power supply, and 32K memory expansion built in, Modem/RS232 stand alone interface, dot matrix printer (DMP 105 by Tandy), a lot of cassette based software, mainly from the BBS over the years of operation, as well as books and magazines, a cassette player, and joysticks and modules: TI Extended BASIC, Parsec, TE2, Mini Memory.
All this for $800.
Other accessories include: SSSD drive, TI disk controller card, Peter Schubert DSDD controller card for his mini-PE system, Disk manager 2 module, and TI-Writer module, disk, and manuals.
And finally a black and white Princess TV.
For information please leave a message on this board or phone Richard on (02)918 6942.
Thanks Richard Vander Reyden. (HEADSPIN)   o

Bug Report

DM1000 Version 3.5
from Geoff Trott

I have been reporting bugs in programs in my editorial column, They're Off, whenever I found reports of them in the publications which crossed my desk. This means that they are quite difficult to find as they do not make the index as a separate item. This showed itself as a problem when Ross Mudie gave me a disk with the programs for download from the BBS on it among which was an Extended BASIC embedded version of DM1000. I remembered that there was a bug reported in it which caused Rolf and me some problems. I then spent a few minutes looking through my TNDs to find it and found that I was forced to agree with Rolf that it would be better if something like that was noted in the index. So here you are, a repeat of that bug and solution under a heading which will be in the index. Any other bugs we find will from now on have a small article like this one to make them easier to find.

This problem with DM1000 relates to formatting of disks in double density, and compatibility with Myarc disk controllers. If you have a TI disk controller then you are not able to use double density so there is not problem. If you have a CorComp or Peter Schubert AT controller then there is a potential problem if you give one of your double density formatted disks to someone with a Myarc controller. If you have a Myarc controller then you would probably use the disk manager supplied with that or else you would have problems. I am now using a Myarc disk controller (HFDC) and so I am very much aware of the potential problems.

The bug is that DM1000 does a double density format using 18 sectors each track but writes onto the disk in sector 0 that the disk has been formatted in 16 sectors each track. The only disk controller which uses this information on the disk is the Myarc disk controller, as it is the only one which allows a choice of the number of sectors per track. This means that if you try to read an incorrect disk on the Myarc it will not be able to read 2 sectors on every track, and the sector numbers will not be correct. There is a similar problem if a disk is formatted to 16 sectors per track on a Myarc disk controller and then read by an AT controller for example. Then the controller would not be able to find 2 sectors on each track which should be there it thinks.

There are two solutions possible. The first is for those with Myarc disk controllers to check each disk they receive from others for the numbers of sectors per track it has been formatted if it is double density and change the byte on sector zero if necessary to make it agree with the actual format. This is the last resort solution as far as I am concerned, and a better solution would be for all who use DM1000 to make the following changes to their copies. In particular, I would like the copy available on the BBS to be correct so that the bug is somewhat confined.

If you have a version of DM1000 which loads via the MENU program or Editor Assembler option 5 then use a disk fixer type program (Disk Utilities) to locate the hexadecimal string on the first sector '100002D0005A'. It should start at byte 216. Change the first 0 to a 2 so that it reads '120002D0005A'. Write the sector back again and all is fixed. On the embedded Extended BASIC version the change is the same but the data is now on the third sector of DM1000_1XB at byte 50. If you have and use a copy of DM1000 for formatting your disks please check it now using a disk fixer program to check that the contents of byte 12 on sector 0 of a newly formatted disk is 12 (hexadecimal) for double density.   o

Jenny's Younger Set

Dear Jenny,
I have here another improved version of my footytab program. With the football season almost upon us, I think this is good time to send it in. I hope it will come in handy for those taking FootyTab cards this year on the football.
                                        Vincent Maker

Dear Vincent
Thank you for your cassette with the letter and program on it. Unfortunately I was not able to read the program. What have you done since the last time you sent me a cassette? I have always been able to read your cassettes before this one. Please try again as I need some help with my FootyTab because I do not know anything about Football!

                                        Jenny

Dear Jenny,
This is Crocodile Jones. I have received another letter...

Dear Crocodile Jones,
I would like you to give me assistance with Adventure #7, Mystery Fun House. I am being shot when I enter the room with the clay pigeons. How can I stop this?
                                        Charlotte Maer

Dear Charlotte,
Take the sign which says,"out of order" from the fortune machine to the shooting gallery and leave it there. Then go through the grate to the room with clay pigeons.
                                        Crocodile Jones   o

Extended Display Package
part 6

by Craig Sheehan

Once the principles of windows are fully understood, the use of HI-Res graphics follows quite easily. Like most XDP commands, the windows are fully supported, however, the coordinate system is slightly modified.

The top left hand pixel of the window is referred to row 1, column 1. The maximum row value is eight times the number of rows in the window. This is because there are eight pixels to a row. The maximum column value can be calculated in a similar way, except it must be remembered that there are eight pixels per column in thirty two column mode and six pixels per column in forty column mode. Once these constraints are noted, it is simply a matter of plotting the pixel using the plot command, which has the following format:

CALL LINK("PLOT", pixel row, pixel column [,....])

However, just as it is necessary to initialise the XDP package before using any XDP commands, PLOT must first be initialised using the PLTCHR command. Points are plotted by redefining a new character, setting the new pixel on, and then placing the new character on the screen. The next time that character has a point plotted on it, the point is just added without replacement. Thankfully, all of this detail is handled automatically by the PLOT command, but first PLTCHR must be used to set the first and last characters to be used for redefinition. Its syntax is:

CALL LINK("PLTCHR" [,starting character [,finishing character]])

If neither the finishing character nor either argument is specified, then defaults of 128 and 239 are assigned to the starting and finishing characters respectively.

For example, the following program plots 100 random points on the screen.

```
100 CALL LINK("XDP")
110 CALL LINK("PLTCHR",128,239)
120 RANDOMIZE
130 FOR POINT=1 TO 100
140 RNDROW=RND*192+1
150 RNDCOL=RND*224+1
160 CALL LINK("PLOT",RNDROW,RNDCOL)
170 NEXT POINT
180 CALL KEY(0,K,S):: IF S=0 THEN 180
190 CALL LINK("NORMAL")
```

Line 110 initialises characters for use with the plot command. In this case we will use the characters between 128 and 239. It is important to ensure that none of these characters (i.e. those between the specified limits) are actually on the screen when points are plotted. If they already appear, extra points will be plotted where they are not intended, and interesting effects can occur when plotting lines and curves. For this example, those characters are removed from the screen when the XDP command is invoked, since this places space characters in all the screen positions. A randomize statement is placed on line 120 to give a different pattern each time the program is run.

Lines 130 to 170 encompass a loop that plots the one hundred randomly selected points. Lines 140 and 150 select the point. Note that since all XDP commands convert numeric arguments to integers, an INT(..) function is not required for the random numbers. The range is selected to include all of the window, which is defaulted to 24 rows and 28 columns by the XDP command in line 100. Finally, line 160 plots the desired point and lines 180 to 190 serve as a simple

loop to exit the program gracefully by pressing any key.

* * * * *

When points are plotted, it appears that any characters that are plotted through are unchanged. The following example illustrates this:

```
100 CALL LINK("XDP")
110 CALL LINK("PLTCHR",128,239)
120 CALL LINK("DISPLY",1,1,"YOU CAN STILL READ THIS")
130 FOR COL=1 TO 224
140 CALL LINK("PLOT",5,COL)
150 NEXT COL
160 CALL KEY(0,K,S):: IF S=0 THEN 160
170 CALL LINK("NORMAL")
```

As the message on the first line of the window says, despite having a line drawn through the text, you can still read it. However, if your program uses CALL LINK("GCHAR"....) to obtain character codes from the screen, if a letter has been plotted over, you will not to get the value you expect. Insert the following lines in the program and rerun it:

```
152 CALL LINK("GCHAR",1,1,CHRCODE)
154 CALL LINK("DISPLY",2,1,".VA",CHRCODE)
```

Since the "Y" character occupies the position (1,1) in the window, you would expect CHRCODE to contain the value 89. However, in the plotting process, this character would have been replaced with character 128. There will be no correlation between specific letters and the code in the screen, and so any program segment that processes data by reading it off the screen must ensure that characters are not plotted over.

To highlight the change of character code, we could give codes 128 to 239 a different colour to show when a character has been replaced. Inserting the following code will show this:

```
102 FOR COLSET=13 TO 26
104 CALL LINK("COLOR",COLSET,1,2)
106 NEXT COLSET
```

As the program is running, you will be able to observe the characters being replaced as points are plotted over them.

* * * * *

For a final example in the use of HI-Res graphics, I will give a small subprogram that plots points based on a list of data. It will assume that a RESTORE statement has been used to obtain the correct list of data. The data must take the following format.

The first number must specify the row number. All of the values following this then specify the column values of points to be plotted on that row. If the column value is negative, then the next value represents how many points are to be drawn in a horizontal straight line starting from that column value. A column value of zero indicates that a new row value follows. If the new row is zero, then no more data is read. The following piece of code does what is described above, and contains the data to write "TIsHUG" on the screen in HI-Res graphics.

```
100 CALL LINK("XDP")
110 CALL LINK("PLTCHR",230,239)
120 RESTORE 1000
130 CALL PLOTDATA
140 CALL KEY(0,K,S):: IF S=0 THEN 140
150 CALL LINK("NORMAL")

1000 DATA 2,-1,5,-7,3,16,20,22,26,-29,4,0
1010 DATA 3,3,8,16,20,22,26,28,0
1020 DATA 4,3,8,-12,3,16,20,22,26,28,0
1030 DATA 5,3,8,11,-16,5,22,26,28,-31,2,0
1040 DATA 6,3,8,-12,2,16,20,22,26,28,32,0
1050 DATA 7,3,8,14,16,20,22,26,28,32,0
1060 DATA 8,3,-7,3,-11,3,16,20,-23,3,-29,3,0,0
```

Expanding Extended BASIC

Writing Assembly Routines, part 1

by David Caron, USA

Many of you have probably bought the Extended BASIC module thinking it was a programmer's paradise only to realise a few months later it really was not that much faster than TI BASIC, certainly slower than other comparable BASIC languages such as Apple BASIC and Commodore 64 BASIC. (I will try hard not to mention them again). Well with assembly routines you can expect parts of your TI Extended BASIC program to run faster than Apple's or Commodore's assembly routines could ever hope to achieve. (This is because the TI99/4A contains a superior CPU chip which does 16-bit operations instead of 8-bit operations and runs three times as fast as the Apple 11(E) or Commodore 64.) If you are thinking of learning assembly language or have already had a go at Mini Memory, this series of articles is something that should interest you.

To follow these articles you will need an Editor Assembler program (such as Funnelweb) as well as the hardware to run the program and of course an Extended BASIC module. This article also assumes you know something about assembly programming such as how the CPU memory is mapped and a bit about the actual instructions involved (like MOV for example). If you are not familiar with the material just mentioned obtain a copy of the famous TI Editor Assembly Manual. For now you must know the difference between decimal and hexadecimal. Take a look at page 421 in the Editor Assembler Manual while you are reading this article or obtain a CPU memory map for the TI99/4A.

When you use Extended BASIC along with the 32K memory expansion, Extended BASIC uses the high memory for the BASIC programs. The high memory is a 24K block starting at address -24576 decimal or >A000 hexadecimal and ending at -1 or >FFFF hexadecimal. The memory expansion has a 32K memory yet I have only accounted for 24K of it; what about the remaining 8K?

The remaining 8K is called low memory and starts at address 8192 decimal or >2000 hexadecimal and ends at address 16383 decimal or >3FFF hexadecimal. This is where your very own "assembly routines" would be placed and executed. Most of that 8K block is for your actual assembly routines, twice as much as the Mini Memory and you get to take advantage of Extended BASIC's power.

The Extended BASIC commands reserved exclusively for Assembly routines are:

        CALL INIT
        CALL LOAD
        CALL LINK
        CALL PEEK

(Sorry, unlike the Mini Memory and the Editor Assembler Module the makers of Extended BASIC forgot about CALL POKEV and CALL PEEKV but you can always make up an assembly routine to make up for this.)

CALL INIT

This command causes Extended BASIC to load a bunch of utility routines into low memory, if it is there. If low memory is not present or it is not working Extended BASIC issues a SYNTAX ERROR message. CALL INIT must be successfully executed in order for CALL LOAD and CALL LINK to work.

CALL LOAD("file name")

This command will load your uncondensed assembled routines into low memory starting at 9456 or >24FA. If you load another assembled routine afterwards, it will be placed after the first one and so on until the low memory is full. At this point you will get a MEMORY FULL ERROR message if you try to load yet another assembler routine (also known as object code). Doing a SIZE command will not help you since that will only tell you the free memory in VDP RAM and the high CPU

memory. I will tell you later how to find out the remaining free memory in low CPU memory.

        CALL LINK("program name",argument1,argument2
                    ,...,argument16)

This command will execute your assembly routine. Notice that you need to type in the name of your program. This is the name you would type after a DEF instruction in your assembler source (the file containing your program created from the editor). A maximum of six characters are allowed for the program name. When you load your program with CALL LOAD, the program name is placed in the low memory 16383 (>3FFF) with the location of the loaded program placed immediately after the name. For example, if you loaded the program called START and it was the first assembler program you loaded after executing a CALL INIT starting at 16384-8 or 16376, an S would be placed, then a T,A,R,T (in ASCII code numbers) and this would bring us up to address 16381. Since the name was only 5 characters instead of six, a space character (32) would be poked. You do not have to include the space character when you insert the program name in a CALL LINK command. The 16-bit number 9460 would be poked into the word address 16382. (In reality this would probably not be the number poked at the word address 16372, but for simplicity assume so for now). Thus starting at 16384 the following bytes would be poked:
        83,84,65,82,84,32,36, and 244.

The first six bytes contain the program name in ASCII code and the last two bytes indicate where the program starts. (36 * 256 + 244 = 9460).

Arguments are numbers, arrays or strings which you can transfer between Extended BASIC and assembly. You can have up to 16 arguments. I will explain more about that in the next article

CALL PEEK(address,byte)

This is the only command which will work without doing a CALL INIT, and therefore will also work without memory expansion. CALL PEEK does exactly what it appears to do; you indicate an address in the first parameter and then place a variable such as A in the second parameter (or argument, same thing). When it is executed, A will be set to the value at the specified address. If you place a variable in the third or fourth parameter, say B or C, B is assigned the value for the next address (after A) and so on.

For example if you wanted to know how much free memory existed in low memory, the following CALL PEEK would let you find out.
        CALL PEEK(8194,A,B,C,D)

The variables A and B indicate the first free address while the addresses C and D indicate the last free address. You can reconstruct the actual 16-bit address using:
        first free address = (A * 256) + B
        last free address = (C * 256) + C

The number of free bytes can be determined by taking the difference.

CALL LOAD(address,byte)

✦   CALL LOAD will function as a poke command as well ✳ as an object loader. The only difference is that you are poking in data from Extended BASIC instead of off the disk. The parameters are identical to those used for CALL PEEK except that you are now transferring the value of the variable, say A to low memory instead. If you wanted to clear low memory without doing another CALL INIT, you could use—
        CALL LOAD(8194,36,244,64,0)

(Notice that the last free address is 16384, which is the first byte past the top of low memory. This is just the way Extended BASIC keeps track.)

If you added an object file from disk after executing the above, that object file would be placed in low memory starting at address 9460 or >24F4.

Techo Time with Lou Amadio

Last month Ben Takach wrote an article on "PE BOX Unregulated Voltage Levels". If you have not read this article, then I strongly recommend that you do so. We tried his suggested auto-transformer on Geoff's system and it worked perfectly. Mains voltage into the PEB was reduced by about 60 volts! Unregulated voltage levels in the box dropped from 25V to 18V and 13V to 9V for the 12V and 5V regulators respectively. Heat dissipation was reduced on all the cards, but especially the HFDC. Apart from the usual precautions which are necessary when working with mains voltages, this is a very simple hardware modification which just might increase the life of your computer. If I get enough feedback, I am prepared to conduct a workshop at one of the meetings. Perhaps we could do this in conjunction with the modification to reduce heat inside the console. It is up to you to let me know.

For those who missed the March meeting at Woodstock, Ross Mudie demonstrated a "JoyTalk" serial printer interface, for 32Kb consoles, which is easily built and costs only about $27. The interface worked well and Ross is in the process of writing an assembly routine which will allow easy access from Extended BASIC. Contact Ross for further information.

At the same meeting, Peter Schubert mentioned that he has had several enquiries from club members for disk controller cards for the Mini PE System. This card is now out of stock. Perhaps the Directors could look at financing a production run of PCB for this very important peripheral (by liquidating some unwanted stock in the shop?).

Power Supply for a Hard Disk   Figure on page 29

The following power supply was designed and built by Geoff Trott specifically for his hard disk system. He needed a supply which was capable of supplying 12V at up to 5 amps and 5V at about 1 amp. The main components consist of:

1) 240 to 15 volt transformer at 5 amps peak.
2) Diodes or bridge to suit above.
3) Filter capacitors (2 x 4700uF at 35V)
4) 12V and 5V regulators (1 amp).
5) 2N3055 power transistor and driver BD140.
6) Large heat sinks and a suitable metal box to house everything.
7) Various other components

With this out of the way Geoff is now working on an interface to connect an RGB colour monitor to the Mechatronics 80 Column card.

GROM Port - Achilles Heel?

Without a doubt, the weakest component in the TI99/4A is the module GROM port. We have all experienced the frustration of computer lockup at some time or other. The problem is due to either dirt or contact wear or both and is, for some reason, exaggerated with the Extended BASIC module. Cleaning modules is not very difficult and everyone probably knows how to do this effectively. Cleaning the module port is a lot more difficult and requires a fair amount of dismantling and reassembling of the console; something to be avoided or at least minimised if possible.

What options, therefore do we have? Minimising module swapping should help. You can do this by using a Navarone Widget which will allow up to three modules to be selected via a switch. However, I find the Widget both awkward and ungainly and I have been looking forward to doing without it ever since I got one. This device is easily bumped with the possibility of lockup!

Some time ago I designed a module port expander to handle up to 6 modules. This was to be mounted behind the console and connected to the GROM port via a ribbon cable. The project was abandoned at an early stage due to its complexity.

Recently some rather elegant solutions have come to light. For example installing the Extended BASIC module permanently inside the console (see Ross Mudie's article, TND August 1988 and errata on page 30 TND November 1988.

Another idea is to combine more than one function into the same module shell. Several of these devices have appeared over the years such as TI-Writer, Disk Manager 2, Editor Assembler or the Super Module with Mini Memory and Editor Assembler. Did you know that it is possible to stack GROMs up to three high inside a module case? How does a combined Extended BASIC and Editor Assembler module or Household Budget Management with Home Financial Decisions sound? A normal single sided module PCB, with 5 IC slots, will hold up to 15 GROMs! Provision has to be made for a miniature selector switch and reset button (both available from Dick Smith). If you are interested, ask to see some examples of what can be done at the next meeting.

A third solution was described by John Willforth in the PUG Peripheral (Dec 1988). Apparently up to 9 GROMs can be installed inside the console by stacking the 3 System GROMs into one socket and installing the new GROMs into the remaining two sockets. As above, you will need a selector switch and reset button. The moulded rib on the far right of the beige console (near the on-off switch) is the ideal location. The selector switch simply switches power (-5V) to pin 14 of each new module function. You could, for example, permanently install Multiplan (5 GROMs) and Editor Assembler (1 GROM) inside the console to be called up at the flick of a switch. Another combination would be TI-Writer (1 GROM), Disk Manager 2 (2 GROMs) and Editor Assembler. You could even install your favourite game! Is there any interest in this sort of hardware modification - perhaps as a workshop at one of the meetings?

Hardware Hint

Module PCB contacts can easily be cleaned by using a cotton bud moistened with alcohol (methylated spirits). If you then very lightly wipe the contacts with a lubricant, such as CRC 2-26, you will minimise wear on the module port.

May all your joys be Hard Ones.... Lou

o

Interfacing to RS232 PIO port

by Geoff Trott

This is an article I published in the old SND in August 1985. It was not treated very well at that time, so I am publishing it again as it may help some people who are having problems with connecting a printer to the PIO port. I developed this simple circuit to allow a Tandy 4 colour printer plotter to work from the TI99/4A for my friend Rolf. It has been a part of my system ever since and also those of my friends and has not failed yet for whatever printer is used. First there is a brief explanation of how the PIO port works and what it expects a printer to do.

The PIO port has 8 lines for the byte of data and two lines for handshaking. One of these lines produces a STROBE signal which is used by the printer to load the data, and the second line is a DATA TAKEN signal from the printer, which is used by the program to know when to send the next byte of data. The software in the Device Service Routine (DSR) of the RS232 card uses these signals as follows.
(1) Wait until DATA TAKEN becomes asserted.

(2) Send the next byte of data out on the data lines.
(3) Assert the STROBE signal.
(4) Wait until the DATA TAKEN signal becomes not asserted.
(5) De-assert the STROBE signal.
(6) Return to the calling program.

This means that the printer must provide a signal which is fed into the DATA TAKEN line and which behaves like a BUSY for the printer. That is, the printer must assert a BUSY signal when it receives the STROBE and then some time later when it is ready to receive the next byte of data it must de-assert the BUSY signal (with the correct assertion levels of course). Most printers have a BUSY signal, an ACKNOWLEDGE signal as well as expecting a STROBE and 8 bits of data. Some printers use the BUSY as expected by the RS232 DSR, and with the correct assertion levels. However printers like the colour printer/plotter have a very fast BUSY (or even no BUSY normally) except when the device is unable to accept any more bytes. These devices may not use BUSY while bytes are being stored in their internal buffers, until these buffers are full. A fast BUSY would not be seen by the PIO hardware/software. The ACKNOWLEDGE signal is used to signify the device is ready to receive the next byte of data, but this is only a short pulse (5 microseconds) which the hardware/software of the RS232 card would also not see.

To overcome this problem, if it is assumed that printers which do not use BUSY on every character can accept bytes into their buffers as fast as the RS232 card can send them, then the addition of a resistor and NPN transistor will enable printers of either type to be used. The idea is to OR the STROBE (complemented) and the BUSY to get the signal for DATA TAKEN which will then change correctly for the RS232 DSR when BUSY does not change and also when BUSY changes. The accompanying figure shows the connections for the cable, with the resistor and transistor most easily placed inside the cover of the 36 pin Centronics plug on the printer end of the cable, if this is a solder type plug. It is simplified by the use of a resistor in the RS232 card for the collector load of the transistor.

PARALLEL PRINTER MODIFIED
WIRING - G.TROTT - ILLAWARRA
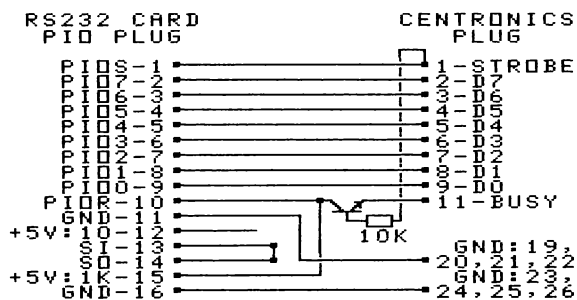
More on JoyTalk
a Low Cost Printer Port

by Ross Mudie

This article is especially for people who have a 32K memory expansion in their TI99/4A console and are looking for a low cost method of connecting a printer to their computer. As mentioned in last month's TND, I have been working on a JoyTalk interface based on articles in 99'er Home Computer Magazine of June and July 1983. The articles contained some errors in the hardware documentation which caused some confusion and could prevent the circuit from working. Once these problems were overcome there were a new set of problems in making the assembly code work in conjunction with Extended BASIC rather than Mini memory for which it was originally designed. With both these problems overcome

the next hurdle was to write an assembly program to perform the LIST function for Extended BASIC which has now also been done.

Members at the March TIsHUG meeting were shown the prototype JoyTalk attached to a TI99/4A, performing the desired PRINT or LIST functions from an Extended BASIC program.

When the program to control the JoyTalk interface is implanted in an Extended BASIC program (which has already been done), it can be loaded from a cassette tape into a 32K memory expanded console. The user of the interface does not need to understand any assembly as the program is accessed by using CALL LINKs. There are four CALL LINKs, which can be used from either COMMAND mode or a running Extended BASIC program, which are:
CALL LINK("JSET",ParameterValue) which sets the baud rate, data bits, parity, stop bits, auto CR and auto LF.
CALL LINK("JOUT","String" or STRING$) which prints a string on the printer.
CALL LINK("JLIST"[,FromLine[,ToLine]]) which lists a program in memory to the printer and screen.
CALL LINK("LIST"[,FromLine[,ToLine]]) which lists a program in memory to the screen only.

The FromLine and ToLine options allow just part of a program in memory to be listed. The SPACE bar is used to pause and restart a program being listed in in addition to the FCTN[4] (CLEAR) key allowing an exit from a listing or a JOUT function.

There is currently one prototype of the necessary hardware hand wired on a small piece of veroboard. It is intended to produce a design for a printed circuit board for the interface which will mount in a small plastic jiffy box. The unit will have a 6 pin DIN plug on a lead which will plug into the modulator socket on the console as a means of obtaining power. The cord to the modulator will plug into a socket on the jiffy box. The +12V interface power is derived from the modulator socket. Another cord will plug into the joystick port on the console to gain the necessary "data" connection to the computer. The printer will plug into a 25 pin D connector on the jiffy box. It is intended that a kit set will be made available for members to buy from the club shop. The anticipated price is between $30 and $40. Members who are not sufficiently confident at building such an electronic project may also be able to purchase a built up and tested kit for a few dollars extra. The necessary software will be available on tape or disk from the club shop or the BBS.

In last month's TND, I asked for an expression of interest in the project. How many kits need to be made available for the shop? So far I have heard from only one person.

For people who have a parallel printer, a serial to parallel (Centronics) interface will also be required. A suitable project kit (ETI 675) was described in Electronics Today International of January 1984. This kit is available from Jaycar Electronics, catalogue number KE4666 at a cost of $32.40.

The JoyTalk will hopefully bring the interfacing from a simple TI99/4A 32K console with Extended BASIC to a RS232 printer, into the price range of some of our members who have a very limited budget.   o

For Sale

Expanding your TI99/4A

typed by Larry Saunders

All prices are in $US

Your TI99/4A is a good little machine. So it follows, then, that the more there is of it, the better it becomes. This line of reasoning only goes so far however, especially if you are trying to justify expanding your system. It helps to get an idea of what kind of peripherals there are for the 99/4A, and how they can help you. When you want, it is much easier to persuade reluctant family members to budget new found necessities.

Before we discuss expansion options though, we should describe a few of the peripherals now available for your computer.

RS232: This little device, available in plug-in form, as an expansion card for the peripheral box, or Mini-System, or even as a module for the cartridge port, is probably one of the first things you will want for your TI99/4A. The reason is simple; most people who want to seriously use the computer want a printer. Word processing, databases and spread sheets (three common "serious" computer applications), are pretty pointless without one. So, before you buy a printer, you have to buy one of these things. Typical RS232 devices include at least two ports; the RS232 port ("modem port") and a PIO or Parallel port ("printer port"). Do not buy one that doesn't have at least these two. Most printers attach to the PIO port these days, and if you do not know what a modem is or what it is useful for, ask someone.

32K RAM: Actually, RAM devices now come in many flavors for the TI99/4A. You will see RAM cards up to 1 Mbyte (1024K) advertised in dealer flyers and catalogs not to mention TI99/4A magazines. Anything over 32K, though, falls into a different category. These devices are either "GROM devices or RAM-disks". (See appropriate section below for information about either of these.) A basic TI99/4A has 16K of memory, which is actually what is known as "video-RAM". There are only 256 bytes of "real" RAM in the console. This device, available as a peripheral card or a plug in device (and for people with friends in user groups, as a device inside the console itself), will expand your system to 32.25K of "real" RAM, and 16K of video-RAM, for a total of a little more then 48K of RAM, Virtually all of the more powerful programs for the TI99/4A require at least this amount of RAM in your computer system. There are a few drawing programs, databases and word processors in cartridge form that will work without it, but virtually all of these become much easier to use and faster programs with this additional memory present. So even if you do serious work only with cartridges, you can still benefit from increased memory.

Disk drives: Once you have a printer port and extra memory, you will definitely want to consider disk drives. While there are word processors and other serious programs that get by just fine with the above peripherals, you will soon get tired of waiting 20 minutes for your work to save and load from a cassette recorder. By this time you will also probably be salivating over the mounds of free software, and tons of commercial software available only in disk format. Talking about disk drives as a single item is a bit misleading, especially in regards to the price. The cheapest way to attach a disk drive to a TI99/4A is if you have a Peripheral Expansion Box. Virtually all of the more sophisticated peripherals require this marvelous device, and it does make expanding your TI99/4A a lot cheaper in the long-run. You can obtain one by browsing the yard sales or by watching the local classified advertisements, but you cannot buy one new TI disk drive anymore. Since they originally sold for

over $300, it is doubtful you will get much of a bargain that way anyway. You can usually pick up a good used box for under $100 and rarely over $200. You can pick up some new drives of various brands (eg. Toshiba half height DS/DD drive $89.95 US), if you do not have a PEB (as we will call the "box"), your disk drive expansion options are limited to the Mini System or CorComp 9900 Micro Expansion System. This little device, with a built in RS232 and 32K retails for $300 to $400, without a disk drive included. (Some distributors sell it for much less though.) A basic disk drive for a TI99/4A is actually several components you can buy separately, or packaged together. There is a "disk controller", the disk drive itself, and the power supply for the disk drive, as well as cables to connect the mess together. The CorComp unit includes the disk controller built-in (a CorComp one, naturally) which can control up to 4 DS/DD (360K capacity) drives. If you have a PEB, you can purchase a new disk controller by Myarc instead, which will control the same as CorComp or Peter's controller that has 32K and RS232 on the one card. Buying a used box will sometimes net you a used TI disk controller, which can handle up to 3 DS/SD drives (180K capacity). Virtually all TI99/4A disk software is distributed around the lowest common denominator, SS/DD, or 90K capacity disks. The nomenclature, by the way, translates into "single sided and single density". The highest capacity typically used is "double sided, double density". There is also something called "double sided, quad density" (720K capacity floppies), but they can be more trouble then they are worth. In any case, if you do not have a PEB, a disk system will cost about $400 with a disk controller, disk drive power supply and case, and cables. With a PEB, it will cost you about $200 to $250 all you will need is the disk controller and the disk drive, the drive will slip right into the PEB.

The above peripherals are the most commonly used with the TI99/4A. As mentioned in the disk drive discussion sometimes you can pick up a used setup with all three things described above for under $500. If you can do that, you will walk away with a real steal because the original setup cost some of us old-timers over $1000 back in 1982. With these three things, and a printer (choosing a printer is a column unto itself), you can run virtually any piece of TI99/4A software. At that point you will find that many serious programs work better with 2 drives, so throwing in another $150 will double your capacity (and more then double the fun). You can make do with less then the 3 items mentioned above just fine, but you will also limit yourself to what you can do with the computer. The basic setup will let you do most anything you could do if you spent $1200 on a PC-clone. However, the TI99/4A keyboard is not as nice and the disk drives sure are not very fast. This is where the many other types of peripherals come in.

RAMdisks: The very first things you should purchase after laying out money for a second disk drive, or maybe even before doing so, or maybe even before doing so, is a RAMdisk. All a RAMdisk is, is a block of memory that thinks its a disk drive. You can save and load programs and data to it just like you would a floppy drive, get a catalog of its contents, even re-initialize it. However, there are a few major differences. One is that all these operations are 10 times faster, and two, unless the RAMdisk has a battery on it or a power transformer you will lose whatever is in it when you turn off the computer. The speed improvement is a real reason to buy one even if you do have to re-load things into it time and time again if it does not have power backup. RAMdisks come in 2 forms as a plug-in box (for CorComp Micro Expansion system owners) and as a card for the PEB. The plug-in one is by CorComp (of course), and as RAMdisks go, is pretty limited. It is also incompatible with some software. As before, PEB owners have a lot more choice. There are RAMdisk cards for the PEB from at least 3 manufacturers; the Myarc RAMdisk, the Horizon RAMdisk and the Rave RAMdisk. These are the cards advertised with enormous amounts of memory installed.

That extra memory is used as a RAMdisk, and in the case of the Myarc model, also a print spooler for your printer (a device which captures text and feeds it to the printer, freeing your computer to do other things). Most programs are RAMdisk friendly, and virtually all will run a lot faster with one. A RAMdisk really eliminates many of the performance differences between a TI99/4A system and some of the more recent computers, and can be very economical (for less then $200 in some cases). A list of the advantages and disadvantages of each is another article altogether, though.

Expanded keyboards: The keyboard was pretty good when the TI99/4A was released, and is considerably sturdier then most, but 48 keys can drive a touch typist to distraction. There is a company called Rave (mentioned above) that makes a device that replaces the TI99/4A keyboard (just the keyboard, not the console shell), with a card into which you can plug any of the many IBM compatible keyboards available. The Rave keyboard replacement can be purchased as a kit (for the technical minded), or put together and with an IBM keyboard included (which is actually a pretty decent keyboard). The constructed model with keyboard (105 keys), is slightly under $200. Those of us that learned to type on a TI99/4A, though, probably do not need one of these. A PEB is not necessary to use this.

GROM devices: If we focused on the technical aspect of this device, we could write a dozen articles, but instead, we will just mention what it is useful for. GROM devices are available typically as a cartridge port plug-in, or, more recently, as a card to plug into the PEB. The same people that make the Horizon RAMdisk also make the PEB card version, which is probably the most fexible one around (they call theirs a "P-GRAM Card"). I will have one very soon for my computer. In any case this device can do a lot of things, particularly for people who like twiddling with the innards of their computer (like me). For the average user it does one thing that justifies buying one; it allows you to vacuum out the contents of your cartridges and save then to disk. It will then allow you to load one or more saved cartridges into the device and run them from a menu. In the case of the P-GRAM card, this essentially means you are putting your most commonly used cartridges into a card on your PEB, where they will be available from a single menu every time you turn on your computer. Some of these devices are "battery-backed" fully or in part, which means that you do not have to re-load your cartridges every time you turn on the computer. GROM devices buy you convenience and a little insurance for your modules (if the saved module fails, just save another copy, or keep several copies of the saved module around). Furthermore, some of these devices offer extra memory that some more flexible programs can take advantage of. The P-GRAM Card even has an optional clock built-in. The price of this devices ranges from $120 for the plug-in versions to $200 for the card. The plug-in versions do not require a PEB.

Hard drives: For the "power-user", or the user with a lot of money to blow, the "ultimate" TI99/4A upgrade is a hard disk drive. Hard drives are attached to the TI99/4A much like floppy drives are. You will need a hard disk drive controller, a hard drive, a power-supply case and the appropriate cables. Simplifying things some, there is only one hard disk controller. It is produced by Myarc, and it will not only control up to 3 hard drives it will also handle 4 DS/DD floppies, so you can sell your floppy drive controller if you buy it, making things a bit cheaper. This controller will work perfectly well with hard disk drives produced for use with an IBM PC or XT computer, and those drives are not only extremely common, they can be purchased even surplus for next to nothing occasionally. For about $500 you can set up a TI99/4A with a 10 to 20 Mbyte hard drive. For under $1000, you could have three 20 Mbyte hard drives up and running. The card will handle up to 240 Mbyte of hard disk storage, so the sky (and your bank account) is the limit. The advantages to a hard drive? The most obvious one is that you can place all your programs in one place and quit juggling floppies. The other major advantage is that hard drives are typically as fast as a RAM disk, so it is like having a 20 Mbyte, battery backed RAMdisk (which would cost you what a small mini-computer would cost if it was available at all). If you are trying to do any database work, or have to handle large lists, a hard drive is highly recommended. This device is for PEB owners only.

80 Column cards: For the more adventurous (those people who are not shy about using a screwdriver and following instructions) there is a device that expands your screen display to 80 columns. Two manufacturers produce an 80 column card, Mechatronics and Dijit. The Dijit card is decidedly the more sophisticated of the two, but requires a PEB, whereas the Mechatronics card plugs into the side of the console and plugs a few things into the mother board (or "brains") of your computer. Both include instructions on how to do it. Both also include a "mouse" port for plugging in an electronic rodent. The only disadvantage to either of these devices is that little software takes advantage of either. If you are not interested in 80 column Multiplan, 80 column terminal emulator, a few 80 column word processors and text editors, or the odd art or picture display program, you really will not get a great deal out of this device. However, since the Mechatronics device is being blown out for $100 US or about $150 Australian from Ben, right now (while supplies last), it really is not a bad deal. If you do a lot of word processing, (like me) 80 columns is a God send, and well worth this; or even the $200 Dijit card (which has a few home video features and better mouse support). (I have the card and the mouse but I am still working on cables between the card and the monitor.)

The Geneve: The other "ultimate" TI99/4A upgrade is not a TI99/4A - it is a whole new computer that sits in your box and runs most TI99/4A software. Before you plug a Geneve in you use software provided to save your cartridges, unplug the TI99/4A, remove the card connecting it to the PEB (this is definitely a PEB device), and plug it in. From then on you are not a TI99/4A user anymore, you are a Geneve user that uses TI99/4A software. The advantages and disadvantages of this device have been mulled over here and elsewhere. However, they can be boiled down considerably. The Geneve essentially is the same thing as having an 80 column card with a keyboard enhancement, a 180K RAMdisk and 32K RAM cards, and a low end GROM card all in one. It also runs most TI99/4A software up to 300% faster. For about $500 then, you get a device which is the same as spending around $800 on your TI99/4A, plus a speed improvement you could not get no matter what you brought for your TI99/4A. The price you pay is some incompatibility with a few cartridges and a few assembly programs, and incompatibility with most RAMdisks, but that is a pretty small price to pay against the benefits listed above. The 80 column versions of TI-Writer and Multiplan provided are also by far the best versions around. Plus many newer programs have been designed to take advantage of some of the special features of this computer. If you have a PEB and are considering enhancing it, take a long, hard look at this device.

Now that you are familiar with some of the major expansion devices available for the TI99/4A, we can talk about specific expansion paths in the near future, as well as some of the real reasons for expanding. Coming topics we will discuss include the economics of expanding your system versus buying another computer, and despite the declining prices of alternate systems, they may surprise you.   o

For Sale

I still have one Modem Card for the PE box for sale for $250. This is a very reliable modem that does 300, 1200\75 and 75\1200 Viatel modes. Phone Peter (02)358 5602. PO Box 28, Kings Cross 2011.
_____   o

Legends, part 1

typed by Larry Saunders

INTRODUCTION

Part of the rather improbable history of Legends (As reported by Fingus the Minor, famous local sage)

Several decades ago, several events occurred which altered forever the lives of the inhabitants of Edonland, located here on this planet of Legends.

The first could be classified as a natural disaster of incredibly Large proportions. The island suffered a series of massive earthquakes. The tremors created massive fissures across the length of the island. Because of an unfortunate choice of scenic but earthquake prone locations by architects, most of the shops, mansions, hovels and churches fell into these gigantic caverns. Shortly after everything was swallowed up by the ground, more earthquakes occured which caused the earth to shift and the fissures to close. This left a rather barren island with a whole bunch of building underneath. Wise men of the time toted that this would be bad for business. More practical types simply shrugged and took residence in their newly relocated homes, or sought to rebuild on the surface. And life went on as always, at least for a while.

Years passed with relative harmony and a little stress (other than an unusually muddy front yard for some). The rich became richer (the shovel business boomed), and the peasants toiled in their fields and shops whistling quaint pleasant tunes as they went about their labours .

In time, however, travellers returning from the outlands began to report strange sightings of many improbable and vicious monsters. Others reported that groups of huge, metal clad warriors would stop them on their journeys and demand gold and tribute. Needless to say, the more cautious thought perhaps some people had been drinking a bit to much.That is until the sightings became closer and closer to the cities and the numbers increased dramatically.

By that time, wise men, noting that this was indeed bad for business, lobbied the king to do something about it. An elite group of Legends knights were dispatched to find out what was going on. Unfortunately, they were never seen again. To make things worse, the monsters and metal warriors (now called the Dark Knights) were roaming the countryside openly and doing pretty much what they pleased, even in the capital of Wizards Rock.

Brave members of the populace fought and many perished before even the most stubborn admitted defeat and bowed to the rule of the Dark Knights and the continuing fear of the monsters that wandered the countryside.

Still, in the quiet of the night in the black rooms of taverns some still gathered and pondered the questions "Who rules the Dark Knights and who has summoned the monsters that harm us all?".

Very recently, these questions were being argued over in the Tall Tales Pub (a local haven for adventurers and other such types), when a very old, wizened cleric staggered in, bloodied and battered, and looked over the crowd with a weary eye. The room fell silent as one after another noted the arrival of this world-worn stranger. Finally, a patron called out, "Do you know the answer to these things that we discuss, sir?" - and the cleric drew himself to his full height, took a deep breath, and said quietly as in thought "It is Ashtar Creel who you seek. It is he who stole the Magic Book of Spells and the Azure Amulet. Ashtar Creel open the western portal to the Land of the Dead and loosed it's monsters to our verdant island. He created the Dark Knights from the dread thoughts of his evil soul and his dark magic." Spent, he collapsed on the closest bench, and said in a whisper that could still be heard plainly through the dead- silent room "The question has been answered." One after another the adventurers and would-be adventurers looked at each other and the silent question spread through the room as if by telepathy, "Who will stop him and save our land?". Some turned away and blanched in fear, this is indeed the hardest question of all...

LEGENDS: PROGRAM DESCRIPTION

Legends is a four player fantasy role playing game. It was designed to create a complex world within the confines of your TI99/4A or Myarc Geneve, and within the far less limited world of your imagination.

As you progress in Legends the characters you create can also grow in strength and power.Their combat skills will improve and they will learn new spells to aid them in their quest. They can accumulate wealth in the form of potions, weapons and armor, gold and knowledge. Eventually, you will find the objects necessary to complete your quest and restore peace and harmony to a land which can surely use both.

Unlike any other type of game, adventurers are designed to be played over a long period of time, and not at one sitting, Legends is no different. In fact, the world of Legends will most likely take dozens of sessions to explore just the island and dozens more for the six large, multi-level dungeons scattered around. Legends is programmed in Extended BASIC with support from a large group of very powerful assembly language programs for such things as high-speed disk access and graphics. Without the months spent on perfecting and honing these routines, written especially for Legends, this program would be impossible.

Legends has four major segments: The Guild, The Island, and the two segments that control the six dungeons. Virtually all the remaining disk space is used to store graphics and monster data which is called by the program as needed. The program uses over 700 sectors on 2 SS/SD disks, or around 180K of code. By most standards a large program.

DISK #1: The Guild and the Island and Graphics data.
DISK #2: The six Dungeons and graphics data.

```
100 DIM A(20,10),B(10,20),C(
10,10),R(10,10),D(10),Y(20),
F(20),SE(10),T(10)
110 FG=12
120 BG=7
125 GOSUB 6000
130 DISPLAY " ** REGRESSION
ANALYSIS **"
140 DISPLAY
150 DISPLAY "PRESS
TO"
160 DISPLAY
170 DISPLAY "   1      ENTER
MATRIX"
180 DISPLAY "   2      ENTER
COLUMN"
190 DISPLAY "   3      CHANG
E ELEMENT"
200 DISPLAY "   4      DISPL
AY MATRIX"
210 DISPLAY "   5      TRANS
FORM MATRIX"
220 DISPLAY "   6      TRANS
FORM COLUMN"
230 DISPLAY "   7      STORE
MATRIX"
240 DISPLAY "   8      LOAD
MATRIX"
250 DISPLAY "   9      REGRE
SSION"
260 DISPLAY : : :
270 CALL KEY(0,KEY,STATUS)
280 IF STATUS=0 THEN 270
290 IF KEY=49 THEN 380
300 IF KEY=50 THEN 510
310 IF KEY=51 THEN 670
320 IF KEY=52 THEN 810
330 IF KEY=53 THEN 990
340 IF KEY=54 THEN 1050
350 IF KEY=55 THEN 1130
360 IF KEY=56 THEN 1250
370 IF KEY=57 THEN 1410
380 FG=13
390 BG=4
395 GOSUB 6000
400 INPUT "NO OF ROWS?":ROWS
410 INPUT "NO OF COLUMNS?":C
OLS
420 DISPLAY
430 FOR J=1 TO COLS
440 DISPLAY "ENTER COLUMN";J
450 FOR I=1 TO ROWS
460 DISPLAY "ITEM";I;J;
470 INPUT A(I,J)
480 NEXT I
490 NEXT J
500 GOTO 110
510 FG=10
520 BG=2
525 GOSUB 6000
530 DISPLAY
540 INPUT "WHICH COLUMN?":K
550 INPUT "NO OF ROWS?":ROWS
560 DISPLAY
570 FOR I=1 TO ROWS
580 DISPLAY "ITEM";I;K;
590 INPUT A(I,K)
600 NEXT I
610 DISPLAY
620 DISPLAY "PRESS R TO REPE
AT M FOR MENU"
630 CALL KEY(0,KEY,STATUS)
640 IF STATUS=0 THEN 630
650 IF KEY=82 THEN 530
660 IF KEY=77 THEN 110
670 FG=15
680 BG=5
685 GOSUB 6000
690 DISPLAY
700 INPUT "WHICH ROW,COLUMN?
":ROW,COL
710 DISPLAY

720 DISPLAY "OLD";ROW;COL;"=
";A(ROW,COL)
730 DISPLAY "NEW";ROW;COL;"=
";
740 INPUT A(ROW,COL)
750 DISPLAY
760 DISPLAY "PRESS R TO REPE
AT M FOR MENU"
770 CALL KEY(0,KEY,STATUS)
780 IF STATUS=0 THEN 770
790 IF KEY=82 THEN 690
800 IF KEY=77 THEN 110
810 FG=15
820 BG=13
825 GOSUB 6000
830 DISPLAY
840 PRINT "CONTENTS OF FILE
";F$
850 DISPLAY
860 FOR J=1 TO COLS
870 PRINT "COLUMN";J
880 FOR I=1 TO ROWS
890 PRINT "ITEM";I;J;"=";A(I
,J)
900 NEXT I
910 DISPLAY
920 NEXT J
930 DISPLAY
940 DISPLAY "PRESS R TO REPE
AT M FOR MENU"
950 CALL KEY(0,KEY,STATUS)
960 IF STATUS=0 THEN 950
970 IF KEY=82 THEN 830
980 IF KEY=77 THEN 110
990 FG=8
1000 BG=5
1005 GOSUB 6000
1010 DISPLAY TAB(5);"TRANSFO
RMING MATRIX"
1020 DISPLAY : : : :-: : : :
: :
1030 GOSUB 4000
1040 GOTO 110
1050 FG=12
1060 BG=7
1065 GOSUB 6000
1070 INPUT "WHICH COLUMN?":K
1080 CALL CLEAR
1085 GOSUB 6000
1090 DISPLAY TAB(4);"TRANSFO
RMING COLUMN";K
1100 DISPLAY : : : : : : : :
: :
1110 GOSUB 5000
1120 GOTO 110
1130 CALL CLEAR
1140 CALL SCREEN(12)
1150 INPUT "FILE NAME?":F$
1160 INPUT "FILE NUMBER?":NO
1170 OPEN #NO:"CS1",SEQUENTI
AL,INTERNAL,OUTPUT,FIXED
1180 FOR J=1 TO COLS
1190 FOR I=1 TO ROWS
1200 PRINT #NO:A(I,J)
1210 NEXT I
1220 NEXT J
1230 CLOSE #NO
1240 GOTO 110
1250 CALL CLEAR
1260 CALL SCREEN(12)
1270 INPUT "NO OF ROWS?":ROW
S
1280 INPUT "NO OF COLUMNS?":
COLS
1290 INPUT "FILE NAME?":F$
1300 INPUT "FILE NUMBER?":NO
1310 OPEN #NO:"CS1",SEQUENTI
AL,INTERNAL,INPUT ,FIXED
1320 RESTORE #NO
1330 FOR J=1 TO COLS
1340 FOR I=1 TO ROWS
1360 INPUT #NO:A(I,J)
1370 NEXT I

1380 NEXT J
1390 CLOSE #NO
1400 GOTO 110
1410 FG=6
1420 BG=7
1425 GOSUB 6000
1430 FOR I=1 TO ROWS
1440 FOR J=1 TO COLS
1450 B(J,I)=A(I,J)
1460 NEXT J
1470 NEXT I
1480 FOR I=1 TO COLS
1490 FOR J=1 TO COLS
1500 SUM=0
1510 FOR K=1 TO ROWS
1520 SUM=SUM+B(J,K)*A(K,I)
1530 NEXT K
1540 C(I,J)=SUM
1550 NEXT J
1560 NEXT I
1570 DISPLAY
1580 PRINT "** X'X MATRIX **
"
1590 DISPLAY
1600 FOR J=1 TO COLS
1610 PRINT "COLUMN";J
1620 FOR I=1 TO COLS
1630 PRINT C(I,J)
1640 NEXT I
1650 NEXT J
1660 DISPLAY
1670 DISPLAY "PRESS R TO REP
EAT C TO GO ON"
1680 CALL KEY(0,KEY,STATUS)
1690 IF STATUS=0 THEN 1680
1700 IF KEY=82 THEN 1570
1710 FOR I=1 TO COLS-2
1720 FOR J=I+1 TO COLS-1
1730 A2=C(1,1)*C(I+1,J+1)-C(
1,I+1)*C(1,J+1)
1740 B2=C(1,1)*C(I+1,I+1)-C(
1,I+1)*C(1,I+1)
1750 E=C(1,1)*C(J+1,J+1)-C(1
,J+1)*C(1,J+1)
1760 R(I,J)=A2/(SQR(B2)*SQR(
E))
1770 NEXT J
1780 NEXT I
1790 DISPLAY
1800 PRINT "** R-MATRIX **"
1810 DISPLAY
1820 FOR I=1 TO COLS-2
1830 FOR J=I+1 TO COLS-1
1840 PRINT "R";I;J;"=";R(I,J
)
1850 NEXT J
1860 NEXT I
1870 DISPLAY
1880 DISPLAY "PRESS R TO REP
EAT C TO GO ON"
1890 CALL KEY(0,KEY,STATUS)
1900 IF STATUS=0 THEN 1890
1910 IF KEY=82 THEN 1790
1920 FOR K=1 TO COLS-1
1930 FOR J=1 TO COLS-1
1940 IF J=K THEN 1960
1950 C(K,J)=C(K,J)/C(K,K)
1960 NEXT J
1970 C(K,K)=1/C(K,K)
1980 FOR I=1 TO COLS-1
1990 IF I=K THEN 2040
2000 FOR J=1 TO COLS-1
2010 IF J=K THEN 2030
2020 C(I,J)=C(I,J)-C(K,J)*C(
I,K)
2030 NEXT J
2040 NEXT I
2050 FOR I=1 TO COLS-1
2060 IF I=K THEN 2080
2070 C(I,K)=-C(I,K)*C(K,K)
2080 NEXT I
2090 NEXT K
2100 FOR I=1 TO COLS-1
```

```
5 CALL CLEAR
8 CALL SCREEN(6)
10 PRINT TAB(6);"TRIGONOMIC
SOLUTION": :
20 PRINT TAB(9);"OF TRIANGLE
S": : : : : : :
22 REM THIS PROGRAM CAN BE
USED IN VARIOUS APPLICATIONS
OF;MATHEMATICS, ENGINEERING,
NAVIGATION, AND SURVEYING.
25 REM AUTHOR:   PHILIP F.
JINGOZIAN,STERLING HEIGHTS,
MICHIGAN  48078 (01/02/82)
30 PRINT "SELECT TYPE OF TRI
ANGLE TO  BE ANALYIZED:": :
:
40 PRINT TAB(1);"ENTER- R =
RIGHT-TRIANGLE"
50 PRINT TAB(3);"ENTER- O =
OBLIQUE-TRIANGLE": : :
60 INPUT "? ":A$
65 PRINT
70 IF A$="R" THEN 95
80 IF A$="O" THEN 1240
90 GO TO 30
95 CALL CLEAR
98 CALL SCREEN(6)
100 PRINT "         *    COM
PUTER WILL"
110 PRINT "         **     S
OLVE FOR"
120 PRINT "        *Z*     AL
L unknown"
130 PRINT "       *—*     RIG
HT-ANGLED"
140 PRINT "    (A)*  *(B)    T
RIANGLE"
150 PRINT "     * +—*     SID
ES & ANGLES"
160 PRINT "    *|  |X=*"
170 PRINT "   *Y|  |90* +——
————+"
180 PRINT " ********* | SID
ES=A,B,C|"
190 PRINT "    (C)    |ANGL
ES=X,Y,Z|"
195 PRINT "             +——
————+": :
200 PRINT "SELECT SIDES & AN
GLES known BY ENTERING NO. O
PPOSITE    PAIR known:": :
210 PRINT " 1)A&B  2)A&C  3)
B&C  4)A&Y": :
220 PRINT " 5)A&Z  6)B&Y  7)
B&Z  8)C&Y": :
230 PRINT " 9)C&Z": : :
240 INPUT "ENTER SELECTION N
O. ? ":T
250 IF T=1 THEN 350
260 IF T=2 THEN 515
270 IF T=3 THEN 600
280 IF T=4 THEN 690
290 IF T=5 THEN 780
300 IF T=6 THEN 870
310 IF T=7 THEN 960
320 IF T=8 THEN 1050
330 IF T=9 THEN 1140
340 GO TO 95
345 REM R/T OPTN 1
350 CALL CLEAR
360 PRINT "SIDES A&B known,
FIND SIDE C (hyp.) AND ANGLE
S Y&Z": : : : :
370 PRINT "ENTER SIDES A&B-T
HEY MUST BE IN THE SAME UNIT
OF MEASURE": :
380 INPUT "A,B? ":A,B
390 C=((A^2)-(B^2))^(1/2)
400 Y=ATN(B/C)*(180/(4*ATN(1
)))
410 Z=90-Y
415 R=(1/2)*(C*B)
420 CALL CLEAR
```

```
421 GO SUB 3000
422 PRINT "          *"
424 PRINT "          **"
426 PRINT "         *Z*"
428 PRINT "        *—*    +—
————+"
430 PRINT "    (A)*  *(B) | S
IDES=A,B,C|"
432 PRINT "     * +—*    |AN
GLES=X,Y,Z|"
434 PRINT "    *|  |X=*    +—
————+"
436 PRINT "   *Y|  |90*"
438 PRINT " *********"
440 PRINT "    (C)": :
445 PRINT "THE GIVEN RIGHT-T
RIANGLE    PARAMETERS ARE:":
:
450 PRINT "SIDE A=";A;" SIDE
B=";B;" SIDE C=";C: :
460 PRINT "ANGLE X=90DEG  AN
GLE Y=";Y;"DEG  ANGLE Z=";Z;
"DEG": :
465 PRINT "TRIANGLE AREA=";R
;"SQ UNITS": :
470 INPUT "DO YOU WISH TO TR
Y ANOTHER  RIGHT-TRIANGLE? Y
ES/NO ":B$
480 IF B$="YES" THEN 95
485 PRINT
490 INPUT "DO YOU WISH TO TR
Y AN OBLIQUE-TRIANGLE? YES/N
O ":C$
500 IF C$="YES" THEN 1240
510 GO TO 3500
515 REM R/T OPTN 2
520 CALL CLEAR
530 PRINT "SIDES A&C known,
FIND SIDE B AND ANGLES Y&Z":
: : : :
540 PRINT "ENTER SIDES A&C-T
HEY MUST BE IN THE SAME UNIT
OF MEASURE": :
550 INPUT "A,C? ":A,C
560 B=((A^2)-(C^2))^(1/2)
570 Z=ATN(C/B)*(180/(4*ATN(1
)))
580 Y=90-Z
590 GO TO 415
600 REM R/T OPTN 3
610 CALL CLEAR
620 PRINT "SIDES B&C known,
FIND SIDE A AND ANGLES Y&Z":
: : : :
630 PRINT "ENTER SIDES B&C-T
HEY MUST BE IN THE SAME UNIT
OF MEASURE": :
640 INPUT "B,C? ":B,C
650 A=((B^2)+(C^2))^(1/2)
660 Y=ATN(B/C)*(180/(4*ATN(1
)))
670 Z=90-Y
680 GO TO 415
690 REM R/T OPTN 4
700 CALL CLEAR
710 PRINT "SIDE A & ANGLE Y
known FIND SIDES B&C AND ANG
LE Z": : : : :
720 PRINT "ENTER SIDE A & AN
GLE Y-ANGLE MUST BE IN DEGRE
ES": :
730 INPUT "A,Y? ":A,Y
740 B=A*(SIN(Y*(4*ATN(1))/18
0))
750 C=A*(COS(Y*(4*ATN(1))/18
0))
760 Z=90-Y
770 GO TO 415
780 REM R/T OPTN 5
790 CALL CLEAR
800 PRINT "SIDE A & ANGLE Z
known, FIND SIDES B&C AND AN
GLE Y": : : : :
```

```
810 PRINT "ENTER SIDE A & AN
GLE Z-ANGLE MUST BE IN DEGRE
ES": :
820 INPUT "A,Z? ":A,Z
830 B=A*(COS(Z*(4*ATN(1))/18
0))
840 C=A*(SIN(Z*(4*ATN(1))/18
0))
850 Y=90-Z
860 GO TO 415
870 REM R/T OPTN 6
880 CALL CLEAR
890 PRINT "SIDE B & ANGLE Y
known, FIND SIDES A&C AND AN
GLE Z": : : : :
900 PRINT "ENTER SIDE B & AN
GLE Y-ANGLE MUST BE IN DEGRE
ES": :
910 INPUT "B,Y? ":B,Y
920 A=B/(SIN(Y*(4*ATN(1))/18
0))
930 C=B/(TAN(Y*(4*ATN(1))/18
0))
940 Z=90-Y
950 GO TO 415
960 REM R/T OPTN 7
970 CALL CLEAR
980 PRINT "SIDE B & ANGLE Z
known, FIND SIDES A&C AND AN
GLE Y": : : : :
990 PRINT "ENTER SIDE B & AN
GLE Z-ANGLE MUST BE IN DEGRE
ES": :
1000 INPUT "B,Z? ":B,Z
1010 A=B/(COS(Z*(4*ATN(1))/1
80))
1020 C=B*(TAN(Z*(4*ATN(1))/1
80))
1030 Y=90-Z
1040 GO TO 415
1050 REM R/T OPTN 8
1060 CALL CLEAR
1070 PRINT "SIDE C & ANGLE Y
 known, FIND SIDES A&B AND A
NGLE Z": : : : :
1080 PRINT "ENTER SIDE C & A
NGLE Y-ANGLE MUST BE IN DEGR
EES": :
1090 INPUT "C,Y? ":C,Y
1100 A=C/(COS(Y*(4*ATN(1))/1
80))
1110 B=C*(TAN(Y*(4*ATN(1))/1
80))
1120 Z=90-Y
1130 GO TO 415
1140 REM R/T OPTN 9
1150 CALL CLEAR
1160 PRINT "SIDE C & ANGLE Z
 known, FIND SIDES A&B AND A
NGLE Y": : : : :
1170 PRINT "ENTER SIDES C &
ANGLE Z-ANGLE MUST BE IN DEG
REES": :
1180 INPUT "C,Z? ":C,Z
1190 A=C/(SIN(Z*(4*ATN(1))/1
80))
1200 B=C/(TAN(Z*(4*ATN(1))/1
80))
1210 Y=90-Z
1220 GO TO 415
1240 REM O/T INTRO
1242 CALL CLEAR
1245 PRINT "         *     CO
MPUTER WILL"
1250 PRINT "        *X*
SOLVE FOR"
1260 PRINT "       *—*     A
LL unknown"
1270 PRINT "(B)*    *(C) OB
LIQUE-ANGLED"
1280 PRINT "   *|    |*
TRIANGLE"
```

```
1290 PRINT " *Z|    |Y* SI
DES & ANGLES"
1300 PRINT "*************"
1310 PRINT "    (A)   +---
-------+"
1320 PRINT "          | SI
DES=A,B,C|"
1330 PRINT "          |ANG
LES=X,Y,Z|"
1340 PRINT "          +---
-------+": :
1350 PRINT "SELECT SIDES & A
NGLES known BY ENTERING NO.
OPPOSITE SETknown:": :
1360 PRINT "1)A,X&Y  2)A,X&Z
3)B,X&Y":
1370 PRINT "4)B,Y&Z  5)C,X&Z
6)C,Y&Z": :
1380 PRINT "7)X,B&C  8)X,A&B
9)Y,A&C":
1390 PRINT "10)Y,B&C  11)Z,A
&B":
1395 PRINT "12)Z,A&C  13)A,B
&C": :
1400 INPUT "ENTER SELECTION
NO. ? ":M
1410 IF M=1 THEN 1550
1420 IF M=2 THEN 1900
1430 IF M=3 THEN 1970
1440 IF M=4 THEN 2050
1450 IF M=5 THEN 2120
1460 IF M=6 THEN 2210
1470 IF M=7 THEN 2280
1480 IF M=8 THEN 2370
1490 IF M=9 THEN 2460
1500 IF M=10 THEN 2550
1510 IF M=11 THEN 2640
1520 IF M=12 THEN 2730
1530 IF M=13 THEN 2820
1540 GO TO 1240
1550 REM O/T OPTN 1
1560 CALL CLEAR
1570 PRINT "SIDE A AND ANGLE
S X&Y known, FIND SIDES B&C
AND ANGLE Z": : : : :
1573 PRINT "ENTER SIDE A AND
ANGLES X&Y-ANGLES MUST BE I
N DEGREES": :
1576 INPUT "A,X,Y? ":A,X,Y
1580 Z=180-(X+Y)
1590 B=(A*(SIN(Y*(4*ATN(1))/
180)))/(SIN(X*(4*ATN(1))/180
))
1600 C=(A*(SIN(Z*(4*ATN(1))/
180)))/(SIN(X*(4*ATN(1))/180
))
1700 Q=(A*B*(SIN(Z*(4*ATN(1)
)/180)))/2
1705 CALL CLEAR
1708 GO SUB 3000
1710 PRINT "      *"
1720 PRINT "     *X*"
1730 PRINT "    *---*    +-
-------+"
1740 PRINT "(B)*    *(C) |
SIDES=A,B,C|"
1750 PRINT "  *|    |*  |A
NGLES=X,Y,Z|"
1760 PRINT "  *Z|    |Y* +-
-------+"
1770 PRINT "*************"
1780 PRINT "    (A)": :
1790 PRINT "THE GIVEN OBLIQU
E-TRIANGLE  PARAMETERS ARE:"
: :
1800 PRINT "SIDE A=";A;" SID
E B=";B;" SIDE C=";C: :
1810 PRINT "ANGLE X=";X;"DEG
ANGLE Y=";Y;"DEG  ANGLE Z=
";Z;"DEG": :
1820 PRINT "TRIANGLE AREA=";
Q;"SQ UNITS": :
```

```
1830 INPUT "DO YOU WISH TO T
RY ANOTHER  OBLIQUE-TRIANGLE
? YES/NO ":D$
1840 PRINT
1850 IF D$="YES" THEN 1240
1860 INPUT "DO YOU WISH TO T
RY A  RIGHT-TRIANGLE? YES/NO
":E$
1870 IF E$="YES" THEN 95
1880 PRINT
1890 GO TO 3500
1900 REM O/T OPTN 2
1910 CALL CLEAR
1920 PRINT "SIDE A AND ANGLE
S X&Z known, FIND SIDES B&C
AND ANGLE Y": : : : :
1930 PRINT "ENTER SIDE A AND
ANGLES X&Z-ANGLES MUST BE I
N DEGREES": :
1940 INPUT "A,X,Z? ":A,X,Z
1950 Y=180-(X+Z)
1960 GO TO 1590
1970 REM O/T OPTN 3
1980 CALL CLEAR
1990 PRINT "SIDE B AND ANGLE
S X&Y known, FIND SIDES A&C
AND ANGLE Z": : : : :
2000 PRINT "ENTER SIDE B AND
ANGLES X&Y-ANGLES MUST BE I
N DEGREES": :
2010 INPUT "B,X,Y? ":B,X,Y
2020 Z=180-(X+Y)
2030 A=(B*(SIN(X*(4*ATN(1))/
180)))/(SIN(Y*(4*ATN(1))/180
))
2040 GO TO 1600
2050 REM O/T OPN 4
2060 CALL CLEAR
2070 PRINT "SIDE B AND ANGLE
S Y&Z known, FIND SIDES A&C
AND ANGLE X": : : : :
2080 PRINT "ENTER SIDE B AND
ANGLES Y&Z-ANGLES MUST BE I
N DEGREES": :
2090 INPUT "B,Y,Z? ":B,Y,Z
2100 X=180-(Y+Z)
2110 GOTO 2030
2120 REM O/T OPTN 5
2130 CALL CLEAR
2140 PRINT "SIDE C AND ANGLE
S X&Z known, FIND SIDES A&B
AND ANGLE Y": : : : :
2150 PRINT "ENTER SIDE C AND
ANGLES X&Z-ANGLES MUST BE I
N DEGREES": :
2160 INPUT "C,X,Z? ":C,X,Z
2170 Y=180-(X+Z)
2180 A=(C*(SIN(X*(4*ATN(1))/
180)))/(SIN(Z*(4*ATN(1))/180
))
2190 B=(A*(SIN(Y*(4*ATN(1))/
180)))/(SIN(X*(4*ATN(1))/180
))
2200 GO TO 1700
2210 REM O/T OPTN 6
2220 CALL CLEAR
2230 PRINT "SIDE C AND ANGLE
S Y&Z known, FIND SIDES A&B
AND ANGLE X": : : : :
2240 PRINT "ENTER SIDE C AND
ANGLES Y&Z-ANGLES MUST BE I
N DEGREES": :
2250 INPUT "C,Y,Z? ":C,Y,Z
2260 X=180-(Y+Z)
2270 GO TO 2180
2280 REM O/T OPTN 7
2290 CALL CLEAR
2300 PRINT "SIDES B&C AND AN
GLE X known, FIND SIDE A AND
ANGLES Y&Z": : : : :
2310 PRINT "ENTER SIDES B&C
AND ANGLE X-ANGLES MUST BE I
N DEGREES": :
```

```
2320 INPUT "B,C,X? ":B,C,X
2330 Y=(ATN((B*(SIN(X*(4*ATN
(1))/180)))/(C-B*(COS(X*(4*A
TN(1))/180)))))*(180/(4*ATN(
1)))
2340 Z=180-(X+Y)
2350 A=(B*(SIN(X*(4*ATN(1))/
180)))/(SIN(Y*(4*ATN(1))/180
))
2360 GO TO 1700
2370 REM O/T OPTN 8
2380 CALL CLEAR
2390 PRINT "SIDES A&B AND AN
GLE X known, FIND SIDE C AND
ANGLES Y&Z": : : : :
2400 PRINT "ENTER SIDES A&B
AND ANGLE X-ANGLES MUST BE I
N DEGREES": :
2410 INPUT "A,B,X? ":A,B,X
2420 P=((1/(1-(((B*(SIN(X*(4
*ATN(1))/180)))/A)^2)))-1)^(
1/2)
2422 L=ATN(P)
2425 Y=L*(180/(4*ATN(1)))
2430 Z=180-(X+Y)
2440 C=(A*(SIN(Z*(4*ATN(1))/
180)))/(SIN(X*(4*ATN(1))/180
))
2450 GO TO 1700
2460 REM O/T OPTN 9
2470 CALL CLEAR
2480 PRINT "SIDES A&C AND AN
GLE Y known, FIND SIDE B AND
ANGLES X&Z": : : : :
2490 PRINT "ENTER SIDES A&C
AND ANGLE Y-ANGLE MUST BE IN
DEGREES": :
2500 INPUT "A,C,Y? ":A,C,Y
2510 Z=(ATN((C*(SIN(Y*(4*ATN
(1))/180)))/(A-C*(COS(Y*(4*A
TN(1))/180)))))*(180/(4*ATN(
1)))
2520 X=180-(Y+Z)
2530 B=(C*(SIN(Y*(4*ATN(1))/
180)))/(SIN(Z*(4*ATN(1))/180
))
2540 GO TO 1700
2550 REM O/T OPTN 10
2560 CALL CLEAR
2570 PRINT "SIDES B&C AND AN
GLE Y known, FIND SIDE A AND
ANGLES X&Z": : : : :
2580 PRINT "ENTER SIDES B&C
AND ANGLE Y-ANGLE MUST BE IN
DEGREES": :
2590 INPUT "B,C,Y? ":B,C,Y
2600 P=((1/(1-(((C*(SIN(Y*(4
*ATN(1))/180)))/B)^2)))-1)^(
1/2)
2605 L=ATN(P)
2608 Z=L*(180/(4*ATN(1)))
2610 X=180-(Y+Z)
2620 A=(B*(SIN(X*(4*ATN(1))/
180)))/(SIN(Y*(4*ATN(1))/180
))
2630 GO TO 1700
2640 REM O/T OPTN 11
2650 CALL CLEAR
2660 PRINT "SIDES A&B AND AN
GLE Z known, FIND SIDE C AND
ANGLES X&Y": : : : :
2670 PRINT "ENTER SIDES A&B
AND ANGLE Z-ANGLE MUST BE IN
DEGREES": :
2680 INPUT "A,B,Z? ":A,B,Z
2690 X=(ATN((A*(SIN(Z*(4*ATN
(1))/180)))/(B-A*(COS(Z*(4*A
TN(1))/180)))))*(180/(4*ATN(
1)))
2700 Y=180-(X+Z)
2710 C=(A*(SIN(Z*(4*ATN(1))/
180)))/(SIN(X*(4*ATN(1))/180
))
```

```
2110 SUM=0
2120 FOR J=1 TO COLS-1
2130 SUM=SUM+C(I,J)*C(J,COLS
)
2140 NEXT J
2150 D(I)=SUM
2160 NEXT I
2170 DISPLAY
2180 PRINT "** REG.COEFFICIE
NTS **"
2190 DISPLAY
2200 FOR I=1 TO COLS-1
2210 PRINT "B";I-1;"=";D(I)
2220 NEXT I
2230 DISPLAY
2240 DISPLAY "PRESS R TO REP
EAT C TO GO ON"
2250 CALL KEY(0,KEY,STATUS)
2260 IF STATUS=0 THEN 2250
2270 IF KEY=82 THEN 2170
2280 FOR I=1 TO ROWS
2290 Y(I)=0
2300 FOR J=2 TO COLS-1
2310 Y(I)=Y(I)+D(J)*A(I,J)
2320 NEXT J
2330 Y(I)=Y(I)+D(1)
2340 F(I)=A(I,COLS)-Y(I)
2350 NEXT I
2360 DISPLAY
2370 PRINT "** ERRORS **"
2380 DISPLAY
2390 FOR I=1 TO ROWS
2400 PRINT "Y-Y*=";F(I)
2410 NEXT I
2420 DISPLAY
2430 DISPLAY "PRESS R TO REP
EAT C TO GO ON"
2440 CALL KEY(0,KEY,STATUS)
2450 IF STATUS=0 THEN 2440
2460 IF KEY=82 THEN 2360
2470 SUM1=0
2480 SUM2=0
2490 FOR I=1 TO ROWS-1
2500 SUM1=SUM1+F(I+1)*F(I)
2510 SUM2=SUM2+F(I)*F(I)
2520 NEXT I
2530 SUM2=SUM2+F(ROWS)*F(ROW
S)
2540 RHO=SUM1/SUM2
2550 DW=2*(1-RHO)
2560 DISPLAY
2570 PRINT "DW=";DW
2580 PRINT "RHO=";RHO
2590 DISPLAY
2600 DISPLAY TAB(7);"PRESS C
TO GO ON"
2610 CALL KEY(0,KEY,STATUS)
2620 IF STATUS=0 THEN 2610
2630 NEG=0
2640 PLUS=0
2650 RUNS=0
2660 A1=F(1)
2670 IF A1>=0 THEN 2700
2680 NEG=NEG+1
2690 GOTO 2710
2700 PLUS=PLUS+1
2710 FOR I=2 TO ROWS
2720 B1=F(I)
2730 IF B1>=0 THEN 2780
2740 NEG=NEG+1
2750 IF A1<0 THEN 2810
2760 RUNS=RUNS+1
2770 GOTO 2810
2780 PLUS=PLUS+1
2790 IF A1>=0 THEN 2810
2800 GOTO 2760
2810 A1=B1
2820 NEXT I
2830 DISPLAY
2840 PRINT "** RUNS TEST **"
2850 DISPLAY
2860 PRINT "N(+)=";PLUS
2870 PRINT "N(-)=";NEG
```

```
2880 PRINT "RUNS=";RUNS
2890 DISPLAY
2900 INPUT "TRANSFORM DATA?"
:E$
2910 IF E$="NO" THEN 3020
2920 FOR J=2 TO COLS
2930 Y1=A(1,J)
2940 A(1,J)=Y1*SQR(1-RHO*RHO
)
2950 FOR I=2 TO ROWS
2960 X1=A(I,J)
2970 A(I,J)=X1-RHO*Y1
2980 Y1=X1
2990 NEXT I
3000 NEXT J
3010 GOTO 1410
3020 H=C(1,COLS)
3030 Q=(H/ROWS)^2
3040 FOR I=1 TO COLS-1
3050 F1=F1+D(I)*C(I,COLS)
3060 NEXT I
3070 G1=(C(COLS,COLS)-F1)/(R
OWS-(COLS-1))
3080 DISPLAY
3090 PRINT "** STD. ERRORS *
*"
3100 DISPLAY
3110 FOR I=1 TO COLS-1
3120 SE(I)=SQR(G1*C(I,I))
3130 PRINT "SE";I-1;"=";SE(I
)
3140 NEXT I
3150 DISPLAY
3160 DISPLAY "PRESS R TO REP
EAT C TO GO ON"
3170 CALL KEY(0,KEY,STATUS)
3180 IF STATUS=0 THEN 3170
3190 IF KEY=82 THEN 3080
3200 DISPLAY
3210 PRINT "** T-VALUES **"
3220 DISPLAY
3230 FOR I=1 TO COLS-1
3240 T(I)=D(I)/SE(I)
3250 PRINT "T";I-1;"=";T(I)
3260 NEXT I
3270 DISPLAY
3280 DISPLAY "PRESS R TO REP
EAT C TO GO ON"
3290 CALL KEY(0,KEY,STATUS)
3300 IF STATUS=0 THEN 3290
3310 IF KEY=82 THEN 3200
3320 R1=1-(G1/((C(COLS,COLS)
-ROWS*Q)/(ROWS-1)))
3330 K1=((F1-ROWS*Q)/(COLS-2
))/G1
3340 DISPLAY
3350 PRINT "R*^2=";R1
3360 PRINT "SEE=";SQR(G1)
3370 PRINT "F";COLS-2;ROWS-(
COLS-1);"=";K1
3380 END
4000 FOR J=1 TO COLS
4010 FOR I=1 TO ROWS
4020 A(I,J)=1*A(I,J)
4030 NEXT I
4040 NEXT J
4050 RETURN
5000 FOR I=1 TO ROWS
5010 A(I,K)=1*A(I,K)
5020 NEXT I
5030 RETURN
6000 CALL CLEAR
6010 CALL CHAR(96,"0")
6020 CALL COLOR(9,2,BG)
6030 FOR SET=1 TO 8
6040 CALL COLOR(SET,2,FG)
6050 NEXT SET
6060 CALL SCREEN(BG)
6070 CALL VCHAR(1,1,96,48)
6080 CALL VCHAR(1,31,96,48)
6090 RETURN                o
```

```
2720 GO TO 1700
2730 REM O/T OPTN 12
2740 CALL CLEAR
2750 PRINT "SIDES A&C AND AN
GLE Z known, FIND SIDE B AND
ANGLES X&Y": : : : :
2760 PRINT "ENTER SIDES A&C
AND ANGLE Z-ANGLE MUST BE IN
DEGREES": :
2770 INPUT "A,C,Z? ":A,C,Z
2780 P=((1/(1-(((A*(SIN(Z*(4
*ATN(1))/180)))/C)^2))-1)^(
1/2)
2785 L=ATN(P)
2788 X=L*(180/(4*ATN(1)))
2790 Y=180-(X+Z)
2800 B=(C*(SIN(Y*(4*ATN(1))/
180)))/(SIN(Z*(4*ATN(1))/180
))
2810 GO TO 1700
2820 REM O/T OPTN 13
2830 CALL CLEAR
2840 PRINT "SIDES A,B&C know
n, FIND ANGLES X,Y&Z": : : :
:
2850 PRINT "ENTER SIDES A,B&
C-SIDES MUSTBE IN THE SAME U
NIT OF        MEASURE": :
2860 INPUT "A,B,C? ":A,B,C
2870 M=((1/((((B^2)+(C^2)-(A
^2))/(2*B*C))^2))-1)^(1/2)
2875 N=ATN(M)
2880 X=N*(180/(4*ATN(1)))
2882 P=((1/(1-(((B*(SIN(X*(4
*ATN(1))/180)))/A)^2))-1)^(
1/2)
2885 L=ATN(P)
2888 Y=L*(180/(4*ATN(1)))
2890 Z=180-(X+Y)
2900 GO TO 1700
3000 PRINT "    PRESS:
FOR:"
3010 PRINT "    -----
---": :
3020 PRINT "    1      PRI
NT TO SCREEN": :
3030 PRINT "    2      THE
RMAL PRINTER": :
3040 PRINT "    3      OTH
ER": : : : : :
3050 GO SUB 3400
3070 K=KEY-48
3080 IF K<>3 THEN 3110
3090 INPUT "DEVICE ? ":DEVIC
E$
3100 GO SUB 3170
3110 IF K<>2 THEN 3140
3120 DEVICE$="TP"
3130 GO TO 3170
3140 IF K<>1 THEN 3050
3160 GO TO 3180
3170 OPEN #1:DEVICE$,OUTPUT
3180 IF K=1 THEN 3190
3190 CALL CLEAR
3200 RETURN
3400 REM CALL KEY
3410 CALL KEY(0,KEY,ST)
3420 IF ST<=0 THEN 3410
3430 RETURN
3500 CALL CLEAR
3505 PRINT "*END OF TRIGONOM
IC SOLUTIONS": : : : : : : :
3510 END                 o
```
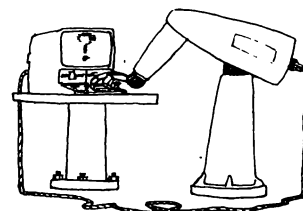
And to several others: Jack Sughrue and his son Matthew for their time and suggestions. Chris Bobbitt for his assistance and support both for Legends and the TI99/4A Home Computer and its users. Barry Boone who wrote the remarkable SYSTEX loader used in Legend and John Clulow who wrote the excellent DSRLNK routine.

STARTUP PROCEDURE

IMPORTANT: Do Not Remove the program disk from the disk drive when playing Legends.

Legends is furnished unprotected so you can make backup copies for personal use only. It is recommended that you make a copy of the disk set and store the originals as the program permanently alters the Dungeon disk during your explorations.

CUSTOMIZING LEGENDS TO YOUR SYSTEM

Legends is supplied on two SS/SD diskettes. If your system is capable of using double side and/or double density disk, you can copy all the files on both disks to a single disk. The program will then bypass prompts to change the disks auto- matically.

USING LEGENDS WITH A RAMDISK

If your system has at least 180K of RAMdisk storage, you will probably find it very desirable to copy all of the Legends files to your RAMdisk. This will greatly speed up the game (at least the disk operations of the game). Be sure to set your RAMdisk to emulate disk drive one and to copy the files back to the game disk when finished playing so as to save your game for the next session.

LOADING THE LEGENDS PROGRAM

Insert the "Island" disk in Drive #1 and select Extended BASIC from the menu. The program will automatically load and run. If you are already in Extended BASIC type: RUN"DSK1.LOAD"

WIZARD'S ROCK

All Legends games start and end at Wizard's Rock.

Ver 1.1 Save game: This feature, like the Time Delay below, is a "Q" key menu option. This allows you to save and quit anywhere on the Island without returning to Wizard's Rock. Note that you cannot continue the game after electing to save it, and also you cannot save the game while in a dungeon.

Ver 1.1 Time Delay: This feature, activated by pressing the "Q" key while on the Island or in the Dungeons and selecting from the action menu, allows you to set the duration messages Legends flashes remain on the screen. It is preset to 50, but experienced players want to reduce it and Geneve users increase it. A party has already been created for your use and will be automatically loaded the first time you run Legends. You can change any or all of the members of the party, or just their names if you desire. Refer to the Adventurer's Guild section for more detailed information about your party and creating a new one.

LEAVING TOWN

After you are finished at Wizard's Rock, you can press the fourth option on the Wizard's Rock main menu LEAVE WIZARD'S ROCK to leave town. Legends will ask you if you really want to do this and to press either Y or N. If you choose to leave you will be asked if you want to deposit some of your gold in the local bank (to protect it from monsters in case something were to happen), and then to select the difficulty level of your quest. 1 is the easiest level and 6 is the most difficult (pretty much suicidal to be truthful). You can reset the difficulty whenever you leave town, and you may want to re-adjust it upwards as the level of your characters increase.

MOVING ON

If you are one of those that dislikes reading instructions you may want to jump ahead to the section on The Island and the Dungeons. Those desiring detailed information may want to read the whole manual before beginning.

WIZARD'S ROCK AND THE ADVENTURER'S GUILD

Playing Legends is not so much one big quest but more like a sequence of smaller quests, each beginning and ending at Wizard's Rock. Wizard's Rock is both an outfitter and a rest stop away from the mayhem of the game. Here your party can rest, catch a drink at the pub, buy some potions from the local Alchemist, or pay for training in the arts of combat and spells. When you first begin the game you come here to create a party of hardy adventurers, or later on to replace characters killed in battle.

WIZARD'S ROCK MAIN MENU

Press -1- Enter the Adventurer's Guild: Legends will go to the Adventurer's Guild section described below.

Press -2- Stay at the Legends Inn: Your party will enter the Legends Inn where you can 1)REST FOR A WHILE, 2)VISIT THE TALL TALES PUB, or 3)LEAVE THE INN. If you choose 1) your party can get good nights sleep. Characters will awaken feeling much better and with health and magic points fully restored. Unfortunately, staying at the inn will not revive dead characters. If you choose 2) the party will enter the pub where if you listen, you might find some interesting clues that will assist you on your quest.

Press -3- Visit the Alchemist: Your party will enter the Alchemist's shop. Here you can buy both healing and magic potions which are vital to the success of your quest. The Alchemist will offer you what he has on hand. If you do not want what he has offer, press "N". He will then offer you another or you can leave.

Press -4- Leave Wizard's Rock: As described above in the Startup Procedure section.

If you want to train your characters for higher levels, create new ones, or simply save the game for next time, the Adventurer's Guild is where you want to be.

MAIN MENU ADVENTURER'S GUILD

Press -1- create a new Character: It is important that you do not use this option unless you intend to create a new character. It will alter all the attributes of the characters currently in memory. This only affects the character you select (you can have one of each profession in your party), and not all the party members.

To create a new character you will first need to select the profession of the character you are creating. After deciding this, the program will then display the following:

STR DEX INT CON CHA HIT MAG

Values will be displayed under each. The higher the value, the better. See the section called AN OVERVIEW OF CHARACTERS AND PARTIES for more information about these things. If you do not like the ramdomly generated statistics, you can have the program generate a different set, over and over until you find the one you like.

Ver 1.1 The difficulty level chosen now influences not only the difficulty of the monsters encountered, but also the amount of gold and experience points awarded.

After selecting a set of attributes, enter the name of the character (which is limited to 6 characters or less). The complete profile of the character will be displayed and you will be given the option of creating another character or of returning to the guild menu.

Hard Disk

What do I do now?

by Geoff Trott

As I wrote last month (They're Off), I have been loaned a Hard Disk controller and a hard disk for use as Editor of the News Digest by John Vandermey until the Directors purchase one for the club. I thought you may be interested in following the saga of how we managed to get the system up and running, and some comments on the usefulness of it all.

First of all we picked up the club's console and PE box from Cyril's place after the AGM. The PE box contained a TI disk controller card and a memory expansion card while the console had wires hanging out and plastic cut off. I took a 9 day trip to Adelaide after the meeting and while there considered the problem of a power supply for a hard disk of 5 volts at a few amps and 12 volts at a few amps. There was also the problem of the over heating of the disk controller card in the PE box because of too high voltages, as explained in Ben Takach's article. So I obtained 3 transformers in Adelaide which made my small case rather heavy on the way home, as well as some other parts. At the time I returned I only had the controller card but no disk.

When I returned we had to rush to get out the News Digest on time so it was not until the next week that I could find time to look at the problems and it was about then that a hard disk appeared from John Vandermey. So with a bit of help from Lou, I made the two regulated supplies, we found the best connections on another transformer to get the best voltages on the PE box (same results as Ben) using the transformers from Adelaide and I was ready to try everything out. Luckily I had a table covered with paper, books, and hardware which was easily swept onto the floor so I could assemble a PE box, console, TV, hard disk, floppy disk and its power supply, hard disk power supply, PE box autotransformer, console transformer and modulator. It took a lot of area! As well as that I needed another power board for all the power connections.

As the hard disk needs to run horizontally, it is not good to mount it in the PE box unless you turn the PE box on its edge. That also means that the PE box takes up less space and you can always get its top off without having to move the monitor etc. That is what I have done, although the hard disk is not in the box yet. When the disk controller has been on for a while the regulators on the card get very hot to the touch even with only 8.5 volts supplied to them. Fortunately Myarc followed the same hole pattern as the TI cards so that I installed the controller into the metal case that the TI controller card previously inhabited. This involved removing the screws and nuts from the Myarc card's 5 volt regulators, chipping off a locating lug from the inside of the case and screwing the case onto the card. The screws and nuts from the Myarc card can be attached to the TI card and then the Myarc card runs only barely warm. Another way would be to mount effective heat sinks inside the plastic case provided by Myarc. Of course I will have similar heat problems with the TI card if I should want to use it now.

Now all was ready for the testing phase. Turn on the hard disk supply and let it run up to speed. Turn on the PE box, floppy disk, TV and then the console. All looks OK so put in the MDM5 disk which comes with the controller card and using Editor Assembler option 5 loader, load MDM5 using the floppy disk DSK1. The controller light comes on and if you wait for about 40 seconds, the program loads and runs and starts by allowing the time and date to be set. It does not use a 24 hour clock and rejects hours greater than 12. If

you start after midnight (as we did), then you must use 0 hours (not 12) for the hour before 1 am or else it will change the am to pm. You can then access floppy disks as per normal, except that you can set up subdirectories on your floppies. The disk name becomes a volume name and can only be changed at format time using this disk manager. The program runs using a menu at the bottom of the screen and is reasonable easy to use but requires a number of key presses to do the simplest function because you constantly need to select between hard and floppy. There is a setup function which allows you to set the colours you prefer and to set single disk operation for either floppy or hard disk or both. This saves another key press if you only have one of each.

The first thing you must do with a new disk is to format it. I tried this on the hard disk only to get an error message and no action. After making sure I was not making some silly mistake by reading the manual (which is quite comprehensive), and finding where it says that you must type in FORMAT as the last thing before it goes off to format, I rang up Rolf who has two small hard disks for help. He came straight over as he was interested in finding out how to get his disks to go and we tried one of his. Lo and behold, it worked! We played with the parameters as he was not sure how many cylinders there were and how fast the stepping motor was. We found that if you formatted more cylinders than there were actually on the disk, the formatter stopped working. The 40 second delay is most disconcerting on the reload of MDM5 after that! Then we tried his other drive with the same result as with John's. So we went back to look at John's drive.

We noticed that there was one jumper on a whole row of pins so we moved it one place. We must have guessed correctly as now it worked. We did not know anything about this disk except that it had at least 2 heads and 882 cylinders, as these were marked on the case as bad sectors. We started at 4 heads and formatted 50 cylinders and increased the number of heads each time we formatted. 5 worked OK but 6 heads caused the program to hang up after formatting 160 sectors (5x32). Then we had a panic as now we could not access the floppy disk to reload MDM5. We had to remove the 24 pin cable until the program had been loaded and the formatter was about to start. We formatted the drive to be 5 heads and 1024 cylinders which gives more than 40 Mbytes and more than 160,000 sectors!

Having formatted the disk there was no delay in accessing DSK1 to load MDM5 again. Now the directory structure must be set up. Each directory can contain 114 sub directories and 127 files. Not having a RAMdisk in the system I decided that I would use Funnelweb to provide the ease of loading. I then set up a directory DSK1 in the root directory and another called DSK. These are used for floppy disk emulation. I have loaded Funnelweb into DSK1 so that I can bring up the menu from Extended BASIC via LOAD or from Editor Assembler option 5 with ENTER using UTIL1. Then I renamed MDM5 as DM and removed DM1000 (useless for a hard disk), so that to get to the disk manager from the title screen I press in order; 2, 2, 5, ENTER, SPACE, 6. I have had to get used to the title screen appearing again after using RAMdisks for some time. I have made a subdirectory of DSK called TIMP and put Multiplan system in there. Unfortunately it seems that Multiplan must have its files in the root directory as it does not allow "." in either the Transfer Setup or the file name. Also it cannot give the directory of the hard disk. That is the worst part of using the hard disk, in fact, the fact that none of the programs that I wish to use allow a Show Directory for the hard disk. Disk Utilities, Funnelweb, Multiplan and Archiver 3.02 do not look at the hard disk, except using the third type of floppy emulation, which is rather restrictive. I had a bit of trouble getting the spelling checker program to read its dictionaries and found that they must not be protected. Also, PRbase disks cannot be read by the Myarc HFDC, they are found to be unformatted.

So on to the good part. The Hard disk is like having an infinite size RAMdisk. It is just as fast at retrieving files and has so much more room. I have set up subdirectories named R for rough, E for edited and P for printed which I use for editing the Newsletter articles. I can use the same filename and simply change the one letter subdirectory to put the files in a different place. For example I run the programs in the E subdirectory through the formatter into the P subdirectory and then look at the result with the editor, say WDS1.E.ADVENTURE to WDS1.P.ADVENTURE. If I need to make some change to the file because the formatting is not quite right I only have to change the P to an E in the LF command. It is great. The only drawback so far is that I have to write the files down on paper as it is so difficult to obtain a directory. By the way, the printout of the directory contains the date and time the file was created and the date and time it was last updated. I like the Disk Manager and the fact that it warns me if I am trying to overwrite a file that is already there. The only bug I have found, apart from hanging if formatting is done incorrectly, is trying to copy multiple files from a subdirectory to the root directory caused a hang. One file at a time seems OK.   o

Press -2- Review Player: On selecting this option you will be allowed to view the statistics about each player individually. Press 5 to return to the guild menu after viewing the characters you want to view.

Press -3- Review Party: This option is used to look at the assets of the party in general. Such things as gold and potions are held in common by all party members. Press any key when done.

Press -4- Train: A character may wish to train for higher levels as his or her experience increases. The chart below indicates the amount of experience needed by each profession to train for higher levels. The cost to train a character is higher with each level he or she wishes to advance to.
Training cost is greatly affected also by the character charisma. A character can advance through 16 levels. All new characters start at level one.

TABLE OF EXPERIENCE REQUIRED FOR TRAINING BY PROFESSION

FIGHTERS Level 1 to Level 2 700 pts + 1200 pts for each level.
RANGERS Level 1 to Level 2 800 pts + 1300 pts for each level.
WIZARDS Level 1 to Level 2 900 pts + 1400 pts for each level.
CLERICS Level 1 to Level 2 900 pts + 1400 pts for each level.

If you choose to train a character you will be asked: TRAIN WHOM? 1-4. Select the number of the character you wish to train. If the character does not have enough experience to train you will be informed how many experience points are needed before training can be done for the next level. Assuming you have enough experience points, the training cost will be calculated. The amount of gold required to train the character will be displayed and you must decide whether your party can afford it or not. If you choose to proceed and you have enough gold, training will commence.

Press -5- Utilities: Several miscellaneous, but important utilities are provided in this area for saving your party to another disk, taking a party from another disk, saving your game, changing the names of your characters, etc.

BACKING UP YOUR PARTY: Only one party can be saved to a backup disk. Legends parties all use common file names and you would overwrite a party stored on a disk unless the party is save to another.

LOADING AN OLD PARTY: This utility is used to load a party from another disk into the game. Unless the party is then saved to the game disk you are using, the party on that disk will remain the same.

SAVE: Will save the current status of your party to your disk. Use this option at the end of a mini-quest so that you can start the game where you left of the next time you run it. If you are using a RAMdisk make sure you copy all the files on the RAMdisk back to a physical one before turning off your computer or you will lose your saved game.

Pressing "5" on the Utilities Menu returns to the Adventurer's Guild Menu.

Pressing "6" will exit the Legends program
                                                        o

TYPEWRITER
Typewriter is one of those things that sort of sneaks up on you. Simply put, it is a program that turns a computer into a typewriter. It is not a clunky manual typewriter either, but a modern "electronic" typewriter incorporating many computer like features such as word wrap, right justification, bold type and auto underline, even centering. Why go all the trouble of making a computer into a typewriter? Because for many jobs, a word processor is too much trouble, or inconvenient. A short BASIC program is too inflexible and requires too much playing around (as well as BASIC expertise). Typewriter is perfect for addressing envelopes, typing out labels, and even writing short letters or filling out forms. Typewriter is also perfect for luring latent computerphobes to the computer. It is non-threatening and very easy to use. The program allows you to adjust your margins and even your tab stops on the fly, and even display the six lines previously typed on the screen. It will either print as you type or a line at a time, so you can make changes before it hits paper. This program makes an excellent companion to your word processor. It is written in 100% assembly by Jim Reiss. It naturally requires a printer, it is completely printer independent and will work with any printer or interface. This item I have on order and will demonstration when it arrives. It takes ? weeks to get it from Asgard Software by air mail both ways. Ordered Oct 88. Rated by MICROpendium as one of the top 5 programs of 1989.   o

For Sale

TIger's Tale

by Harry Brasher, from Asgard News

Have you got a commercial program in your collection of software that has a handwritten label on it? Do you have a couple of programs laying around that did not come with documentation on the disk, that you never learned to run? Have you ever spent hours cracking a protected program you brought, just so you could watch those sectored walls come tumbling down? Have the first words you typed to your Extended BASIC environment ever been: CALL INIT :: CALL LOAD(-31931,0)? If you answered "YES" to any of the above, welcome to the club!

Are you and I wielding the cutlass that beheads our software authors? Are we wearing the patch that blinds us to the inevitable demise of all software for the TI99/4A computer! Etc., etc., and... I think not! Last year I spent approximately three hundred dollars on software, both fairware and commercial products. Yet, I am a pirate! (I am not a hacker, I could not beat my way out of a protection scheme if it were made of butter.) I am also a most trusted member of the beta testing community, and I always send programs back after I review them, uncopied. Could this be a dual personality, you ask? No, it is more of an "honour among thieves", a bit of philosophy, and a basic respect for the people and firms that I deal with.

The program I am using for this article, TI-Writer, cost me over one hundred dollars seven years ago. In my extensive collection of software, there are at least three other major competitors to this program, but I do not use them. I looked for years to find a better word processor than this one, to no avail (it is obvious that Harry has not tried Press). There is none better. I would estimate that my search could have cost me an additional $175, and I would have arrived at the same conclusion. In fact, it did cost me $50 to become one of the first registered users of WriterEase. This fifty dollar wonder is totally useless to me however, because it is protected to the nines. I cannot put it in my Horizon RAMdisk, and I cannot add words like "microfiche" to the dictionary, which I use every day in my business letters. Hence, WriterEase resides in its original wrapper and my fifty dollars is gone forever. I anxiously await a cracked copy, however, so that I may at least get some use out of it.

Let me tell you another one. I like to write,and I help turn out one of the best looking group newsletters around, if I do say so myself. I am always looking for software to make my job easier, or make the newsletter look better. When the Printer's Apprentice first appeared I was impressed by the advertising and sent for the program. As I recall, I believe that it was priced at $39.95 back then. Upon receipt of the software, I found that I could not successfully get my layouts to the printer. I also discovered that the same company had produced a program that I had purchased a year before called Business Graphics 99. I had not been able to get that one to work either; same problem. This time I wrote letters, two or three of them, and received replies very quickly. None of them helped, because I found that the program was not usable with a Gemini 15 printer, only later models of the Gemini series. The company would not refund my money even though I had proved conclusively that it would not work for me. I was forced to sell both programs for a total of $20. A net loss of another fifty smackers.

My policies before were a bit loose, now they are firm. If it cost over ten dollars, I will wait for a copy to come along. Then, if I like it, and find a use for it, I will buy it. What other choice do I have? I am not a rich man.

On the subject of fairware, things are a bit different. With these programs, I am allowed to try before I buy, and I have bought quite a few. Only on rare occasions, however, have I bought version 1.0. No amount of beta testing will ever bring out all the ways a human being can screw up a program. A prime example PRBase. Version one was a bear to work with, (although I did use it for over a year) but it had a lot of potential. When version 2.0 was announced, my money was in the mail the same day, and I have never regretted my decision to pay my money. I think there are a lot, maybe a majority, of people that feel the same way about the fairware market. Usage is the million dollar word. Having been a member of my group for five years, I am very close to most of the people there. Close enough to know they will be honest with me. I queried my group on the ownership of a given program one night. Out of the thirty-three members present, at least twenty-five of them owned it, only one person was USING it, and he had paid the fairware fee. There are hundreds of copies of the Usable Disk Cataloguer in the TI99/4A community. (My own donation to the fairware game.) I have received donations of slightly over a hundred dollars in two years. So what! It is not a program that everybody needs, wants, or uses. Never the less, it has been revised up to version 2.4, and I continue to add things as they are needed. It only fills a niche, a tiny niche, and I have received exactly what I expected. I am happy!

Now let us look at the other side of the usage coin. I am not here to be loved, so let me put it this way. I dare every one of you, as soon as you finish this, to go to your desk and mail one stinking dollar to Barry Boone for his Archiver,and one dollar to the Ottawa user group for DM1000. Do not tell me you do not use them I do not believe it. If you have already sent money, fine, good for you! but I am talking about the fifty thousand people out there that use both of those programs on a weekly basis and have not send a penny. Do not feel bad about not paying ten dollars, or five dollars, because one dollar would really do if every one of you pirates sent one. There is no question that at first the authors are going to be highly insulted about such a minor reward for their efforts, but if they received ten thousand one dollar offerings, I think they might change their attitudes.

Here is the way I see the TI99/4A software community:
(1) We, the users, are suffering from the after shock of the early eighties. We, more than any other computer, were cheated time and time again by people that wanted to make a quick buck in the software field. This can, and does, still happen today. How many stupid BASIC programs do you have around from the days when cassettes cost $19.95?

(2) We demand to see what we are going to buy. We are less interested in the software than we are in the computer itself. How much can we squeeze out of this little baby? The software shows us that. We may not use it, but we do keep it laying around for the proof.

(3) We do not pirate everything! If we did, Tenex, Triton, and half of dozen other companies could not stay in business.

(4) The highest percentage of the TI99/4A community has no access to pirated software. Mainly this is true because they do not belong to the groups where you come in contact with the pirate captains. Ninety percent of groups do not condone piracy, therefore, new users will not have access to "those"programs for quite some time.

(5) If the program is good, does "it" better than it is been done before, is relatively bug free, fills a need and gets used, it will get paid for; sooner or later.

Disassembling Extended BASIC

by Ross Mudie

During the preparation of software to permit Extended BASIC programs to be listed via a JoyTalk Interface to a RS232 printer, I found that I needed to more fully understand just how Extended BASIC stored a program. In general terms the line number table is in one block of memory and the the program lines, without the line numbers at the start of each line, are in an adjacent block of memory. Each line starts with a length byte which describes the number of bytes following in the line. The reserved words are stored in token form which means that each reserved word is represented by a one byte number. For example, the token for PRINT is hexadecimal 9C or decimal 156.

The location of the line number table is contained in memory locations (hexadecimal) >8332 and >8330, (decimal -31950 and -31952). >8332 points to the lowest line number and >8330 points to the highest line number. The table of line numbers contains the line number in two bytes followed by the address of the line in two bytes. The address of the line data points to the first token in the line, which is preceded by the length byte. Each line contains a length byte, tokens, text (preceded by their own length bytes) and the line terminates in a byte of zero.

The program, which follows this article, allows disassembly of itself and any other program which happens to be merged with it, and prints out via the PIO to a printer. It is designed for use with a 32K computer and will not work with an unexpanded console.

Before getting into the program here are some ideas on how both BASICs handle address values. Addresses in CALL PEEK or CALL LOAD always use decimal values. An address between 0 and >7FFF will always be positive, whilst an address between >8000 and >FFFF will always be negative. An address is stored in two bytes, where the first or Most Significant Byte (MSB) gives the number of 256's and the second or Least Significant Byte (LSB) gives the number of units in the range of 0 to 255. To calculate an address if A is the MSB and B is the LSB then the address is 256*A+B. If the result is greater than >7FFF (32767) then 65536 is subtracted from the value. If A=128 and B=0 then to calculate the address needed for PEEK or LOAD is as follows:

```
Example 1: A=128, B=0.      Example 2: A=255, B=255
           (>8000)                     (>FFFF)
Address=A*256+B-65536       Address=A*256+B-65536
      =128*256+0-65536            =255*256+255-65536
      =32768-65536               =65535-65536
      =-32767                    =-1
```

In summary, any address between >8000 and >FFFF (decimal 32768 and 65535) must have 65536 subtracted from it before use in CALL PEEK or CALL LOAD.

I have decided to leave this article here. It leaves you the reader with something to discover. If you have a copy of TI99/4A Intern look in pages 146 to 146 for some of the BASIC reserved word tokens. Then have a fiddle with the program which follows and discover what the additional Extended BASIC tokens are.

Please let me know if you find this file and program interesting, all writers appreciate a bit of feedback, myself included. A short note to SYSOP via this BBS is all that is needed.

```
100 ! SAVE DSK1.XBDISASS
110 ! By Ross Mudie, TISHUG,23rd February 1989.
120 CALL INIT
130 CALL PEEK(-31952,A,B,C,D)
140 OPEN #1:"PIO"
150 PRINT #1:"LINE NUMBER TABLE":"Address Line
    Line":"        Number  Address"
160 FOR Z=A6+B-65536 TO C6+D-65536 STEP 4
170 CALL PEEK(Z,E,F,G,H)
180 PRINT #1:Z;TAB(8);E6+F;TAB(18);G6+H-65536-1
190 NEXT Z
200 PRINT #1: :"X/B PROGRAM LINES":"Address
    Data";TAB(52);"Interpretation"
210 FOR Y=C6+D-65536+1 TO -25 STEP 8
220 CALL
    PEEK(Y,P(1),P(2),P(3),P(4),P(5),P(6),P(7),P(8))
230 PRINT #1:Y;TAB(6);P(1);TAB(12);P(2);TAB(18);P(3);
    TAB(24);P(4);TAB(30);P(5);TAB(36);P(6);TAB(42);
    P(7);TAB(48);P(8);TAB(56);
240 FOR I=1 TO 8
250 IF P(I)>31 AND P(I)<127 THEN PRINT
    #1:CHR$(P(I));ELSE PRINT #1:".";
260 NEXT I
270 PRINT #1
280 NEXT Y
290 CLOSE #1                              o
```

(6) The software people must not protect. I, for one, will never buy a protected program if I know it is. I am sitting here with one million, one hundred and fifty two thousand bytes of battery-backed RAM. I intend to use it! I cannot if a program is protected.

(7) I believe this is a mature community that pays out more per capita today than they ever have before for good software. I do not believe that we read about programs here or in MICROpendium, want them, and wait around for them to passed along for free.

(8) It is all in the attitude. If you get mad and walk off in a huff because you did not make a thousand dollars the first week your software was out, you will never make it! Think. Is it possible that your program was not necessary? Did it have some bugs that needed correcting? Was the exposure wrong, or too short? You can either do something about it, and make that thousand, or else it will lay around my "future reference archives" forever.

(9) In conjunction with the preceding statement; I would bet my bottom dollar fifty percent of the total community will not be aware of the existence of a program, commercial or fairware, within a year. Remember, less than twenty-five percent of TI99/4A people belong to groups, and less than ten percent have modems. The mailing list of Triton or Tenex is well in excess of a hundred thousand names.   o

```
10000 SUB PLOTDATA
10010 READ ROW :: IF ROW=0 THEN SUBEXIT
10020 READ COL :: ON SGN(COL)+2 GOTO 10030,10010,10040
10030 READ REPT :: COL=ABS(COL):: GOTO 10050
10040 REPT=1
10050 FOR C=COL TO COL+REPT-1
10060 CALL LINK("PLOT",ROW,C)
10070 NEXT C
10080 GOTO 10020
10090 SUBEND
```

If you wish to use the subprogram in your own program, it is only necessary to include lines 10000 to 10090, but you must supply your data for the graphics. The map of Australia on the XDP demonstration program was drawn using a subprogram similar to this.

References from the XDP Utility Guide for this months article are PLOT (page 27) and PLTCHR (page 28).

Next Month: In the final part of this series, I will describe algorithms that are used to draw lines, circles and other geometric shapes using HI-Resolution graphics.   o

Creating your own printer characters

by Lou Amadio

Modern printers offer, amongst other things, a feature called "Down Load Characters". Down Load Characters (DLC) are characters which are transferred to the printer RAM memory by a computer program in order to change the type of characters which are printed.

DLCs are usually created by the user and, in theory, all of the keyboard characters can be redesigned to any design that the user desires.

The steps involved in using DLCs are:

a) Create a new character

b) Down load the character to the printer RAM.

c) Use the redefined keyboard character in word processing or BASIC.

Creating Characters

To design your own printer characters, you must control the firing of the individual pins in the printer head. Fortunately this is a fairly straight-forward procedure.

The format for sending character data to a printer is:

```
ESC & NUL A1..A2 m0 m1..m11 where
ESC is the escape code (CHR$(27) in BASIC)
NUL is ASCII zero, ie CHR$(0),
A1 is the 1st char to be defined
A2 is the last char to be defined
m0 is the attribute byte - (CHR$(139)
m1...m11 are the dot data bytes which define the
    characters for the printer.
```

The example below shows how to design a symbol for a car. To use the new symbol you must redefine one of the keys on the keyboard.

There are 9 pins in the head of a dot matrix printer. Normally only 7 are used to print characters, while the bottom 2 are only used for lower case characters which have descenders, such as the "p" illustrated below. DLCs use 8 of the available 9 pins in the head.
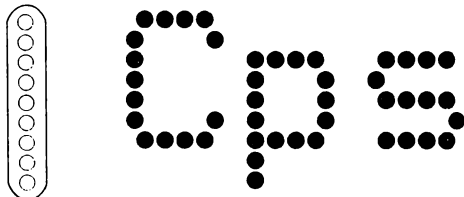
The figure below shows a character matrix made up of 11 columns and 8 rows - ie a maximum of 88 possible dot locations. In practice, however, at least one column and row is left blank unless you want the characters to join up on print out.

The matrix is numbered m1 to m11 for the columns and 1 to 128 for the rows. The numbers actually identify which pin(s) will fire to produce the required character.
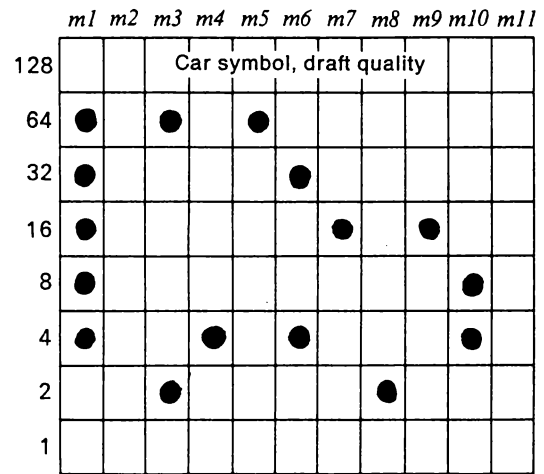
	m1	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11
128			Car symbol, draft quality								
64	●		●		●						
32	●					●					
16	●						●		●		
8	●									●	
4	●			●		●				●	
2			●					●			
1											
Dot data	124	0	66	4	64	36	16	2	16	12	0

ASCII Code	92		
Descender	1	m0 =	Descender x 128
Start column	0		+ (Start x 16)
End column	11		+ End

We start by filling in dots where we want the printer pins to fire. Note that, due to timing limitations, you cannot fire two adjacent pins on the same row.

Next we sum the values shown by the dots for each column in turn — eg the sum of the values indicated on the Y axis for column "m1" is:

$$64+32+16+8+4=124$$

The string of numeric values generated ("dot data" in the illustration) must now be sent to the printer before the new character can be printed. Prior to doing this, however, we need to do three more things:

a) We need to decide which keyboard character will be redefined. This example will use the "|" (ASCII 124). Check the ASCII table in your printer manual.
b) We must assign an attribute byte m0 (usually decimal 139) which is information on whether we want proportional spacing or not. Check your printer manual for more details.
c) We must activate the printer RAM to accept DLCs - this is an internal dip switch setting. After changing the appropriate switch, turn the printer off then on again to initialise the new setting.

Downloading Characters

The following Extended BASIC program illustrates how to send the "dot data" codes and also provides a quick check of a newly defined character.

```
100 CALL CLEAR
110 PRINT "Downloading [|] to printer RAM"
120 !DESIGN DATA FOR CAR
130 DATA 124,0,66,4,64,36, 16,2,16,12,0
140 !INITIALISE PRINTER
150 OPEN #1:"PIO" :: PRINT #1:CHR$(27);"@";
160 !SET DRAFT QUALITY
170 PRINT #1:CHR$(27);"x0";
180 !SEND CHAR PARAMETERS FOR "|" CHARACTER
190 PRINT #1:CHR$(27);"&";CHR$(0);"||";CHR$(139);
200 !SEND DATA FOR CAR
210 FOR X=1 TO 11:: READ D:: PRINT #1:CHR$(D);::: NEXT X
220 !SELECT USER DEFINED CHARACTER SET
230 PRINT #1:CHR$(27);"%1";
240 !PRINT SAMPLE CHARACTER
250 PRINT #1:"||||||||||||||||||||||||"
270 PRINT #1:"| || | || | || | || |"
280 CLOSE #1
```

Line 130 is a DATA statement which contains the "dot data" corresponding to the totals in columns m1 to m11 from the character matrix above.

Line 150 "OPENs" the printer as a file and resets it by sending the CHR$(27);"@" code.

Line 170 selects draft quality characters for printing - (CHR$(27);"x0". This will be ignored if your printer does not have an NLQ mode.

Line 190 holds the escape code to download the data to the printer as well as setting "|" as the redefined character. Two || are required to indicate the first and last character to be redefined. CHR$(139) is the attribute byte, m0.

Line 210 reads in the 11 bytes of dot data (m1...m11) from line 130

Line 230 selects the User Defined Character Set which has just been created in the printer's RAM area. In this example we have only redefined one character so that the remaining keyboard characters are copied across "as is" into the printer's RAM memory.

Lines 250 and 260 provide a sample printout of the redefined "|" character (see below).

〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕 〔〕

Any number of characters may be redefined using the above method. Simply change the dot data in line 130 to suit your new character. Do not forget to change the character symbols in line 190 to some other relatively unused keyboard character.

If a large number of characters is to be redefined (eg the entire alphabet) 11 bytes of data must be calculated and sent to the printer for each new character. In this case line 190 must contain the symbols for both the first AND last characters. Another loop then must be set up to download the dot data for each character in turn.

Note:-
1) The newly defined characters will remain in the printer RAM until the printer is switched off.
2) The printer's RAM buffer is not available whilst using DLCs.
3) The process above is only suitable for defining draft quality print.

<u>Near Letter Quality Characters</u>

It is possible to create your own NLQ characters, but the dot data requirements are more involved. If your printer supports a Near Letter Quality (NLQ) mode, then you can take advantage of this feature when redefining characters.

The diagram below shows how to design an NLQ character (a motor car) using a similar grid to that required for the draft character. The main difference being that, although the grid is the same overall size, it now has 16 high x 23 wide for a maximum of 368 dot positions! In practice, however, we are not going to use all of these, but the possibilities are almost endless.

As before, we cannot utilise horizontally adjacent dots on the same row. Referring to the diagram, in each grid column, the 1st, 3rd, 5th, etc, dots belong to the first pass of the print head, and the 2nd, 4th, 6th, etc, dots belong to the second pass. We sum the dot data for each pass and include it the DATA statement of our program.

First *m1*...   ...*m23* Second
pass   *m24*...   Car symbol, near letter quality   ...*m46* pass

Dot data
1st: 14 38 70 70 126 0 0 0 9 9 8 0
      16 1   1   0   0 70 38 22 6 6 6

2nd: 28 14 14 14 124 0 64 32 16 0 0 /0
      32 64 0   0   0 12 12 14 14 14 12

ASCII Code   92
Descender |
Left space: 0   m0 = Descender x 128
Right space: 0   + (Left x 16) + Right

The format of the printer command is:

<ESC> "&" NUL A1 A2 m0 m1....m23

where m1 to m23 define the NLQ bytes summed from the grid above.
The BASIC program only needs slight modification to accomodate NLQ characters:

```
100 CALL CLEAR! NLQ CHARS
110 PRINT "Downloading [|] to printer RAM"
120 !NLQ DESIGN DATA FOR CAR
130 DATA 14,16,38,1,70,1,70,0,126,0,0,70,0,38,0,22,9,
    6,9,6,8,6,0
135 DATA 28,32,14,64,14,0,14,0,124,0,0,12,64,12,32,14,
    16,14,0,14,0,12,0
140 !INITIALISE PRINTER
150 OPEN #1:"PIO" :: PRINT #1:CHR$(27);"@";
160 !SET NLQ QUALITY
170 PRINT #1:CHR$(27);"x1";
180 !SEND CHAR PARAMETERS FOR "|" CHARACTER
190 PRINT #1:CHR$(27);"&";CHR$(0);"||";CHR$(139);
200 !SEND NLQ DATA FOR CAR
210 FOR X=1 TO 46 :: READ D :: PRINT #1:CHR$(D); ::
    NEXT X
220 !SELECT USER DEFINED CHARACTER SET
230 PRINT #1:CHR$(27);"%1";
240 !PRINT SAMPLE CHARACTER
250 PRINT #1:"|||||||||||||||||||||||||"
260 PRINT #1:"| | | | | | | | | | | | |"
270 CLOSE #1
```

Lines 130 and 135 contain the data bytes for the 2 print head passes for the NLQ character. Do not forget to enable the dip switch which allows download characters to be accepted by the printer (check your printer manual).

A sample of the car in NLQ mode is shown below:

🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗

It should be possible to redefine characters within TI-Writer by using the Transliterate command, but more on this at another time.   o

Tips from the Tigercub #29

by Jim Peterson, Tigercub Software, USA

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I goofed again. In the I/O ERROR routine in Tips #28, the ON ERROR STOP will do no good in the place where I put it. It should be placed after the file is opened in line 100 so that it will become the current error trap if the file is opened correctly.

And the CALL KEY example in Tips #28 will look better if R=14. A couple of very knowledgeable programmers have written to tell me that I was wrong, and the manual is right, about CALL KEY status -1. They say that -1 simply means that the same key is being pressed as was pressed during the last keyscan, and that it could have been released and repressed in the interim. This may be, but try this routine and see if you can release and repress a key without getting a status code 0 (no key pressed) and status code 1 (different key pressed) before another status code -1.

```
100 CALL KEY(0,K,S):: PRINT K,S :: GOTO 100
```

George Steffen has responded to the challenge in the last Tips, by publishing in the LA 99ers TopIcs a remarkably compact routine to translate the internal format string representation of numeric data back into numbers. The following lines will update the Menu Loader accordingly.

```
100 !by A. Kludge/M. Gordon/T. Boisseau/J.
    Peterson/G. Steffen/etc.Version #8, 11/85
140 @,@@,A,A$,B,C,D$,E,F,FLAG,I,J,K,KD,KK,M,M$,N$,NN,P,
    P$,PG$(),PP,PP$,Q$,S,ST,T$(),TT,VT,V(,),W$,X,X$,Y,
    K2,S2
810 F=1 :: E=ASC(SEG$(M$,1,1)):: M=ASC(SEG$(M$,2,1))::
    IF E=0 AND M=0 THEN GOTO 817 ELSE IF E>128 AND
    M>128 THEN F=-1 :: E=255-E :: M=256-M
815 FOR I=1 TO 6 :: M=M+(ASC(SEG$(M$,I+2,1)))/100 I ::
    NEXT I :: M=M*F*100 (E-64)
817 PRINT #PP:M
870 FOR P=1 TO NN-1 :: PRINT #2:PG$(P);TAB(15);V(P,3);
    TAB(20);T$(ABS(V(P,1)));TAB(25);V(P,2);TAB(31);
    CHR$(89*ABS(V(P,1)<0)):: NEXT P :: CLOSE #2
```

The change in the last line is my own, because it was pointed out to me that the catalog output to the printer did not indicate protected files.

That last line is a good example of the power of relational expressions to accomplish compact programming. The variable V(P,1) picks up its value from the variable A which is read from the disk directory in line 350. This is a number from 1 to 5, indicating the type of file, and if the file is write protected the number is negative. A true expression has a relational value of -1. If the file is protected, V(P,1)<0 is true, and its value is -1, converted by ABS to +1 and multiplied by 89 to give ASCII 89, converted by CHR$ to "Y". If not protected, V(P,1) is a positive number, V(P,1)<0 is false and has a relational value of 0; 89 times 0 is still 0, and CHR$(0) prints nothing.

George also mentioned in a letter that my remarks on the UPDATE mode applied only to VARIABLE files; that RESTORE without a number,to return the record pointer to the beginning of a file, works only with VARIABLE files; that RESTORE with a number works only with RELATIVE files; and that therefore the only way to RESTORE a SEQUENTIAL FIXED file is to close it and reopen it.

On trying this out, I find that you can write to a FIXED SEQUENTIAL file and still be able to read the following records - but you cannot simply "read a record, change it in some way, and then write the altered record back out on the file", as the Reference Guide indicates, because you will change the record FOLLOWING the one you read! It is possible to UPDATE a FIXED SEQUENTIAL file without reading it all into an array and writing it back out, but you must read sequentially to the record you want, close the file, reopen the file, read back to the record just before the one you want to update, then write in the updated record.

I have received several other suggestions regarding the Menu Loader, too many to describe here. You can all modify it to your own tastes and needs. Remember to turn off the pre-scan and ON ERROR while you are working on it, then add any new variable names or CALLs to the pre-scan. And remember, that last line MUST be the LAST line of the program! You can resequence it higher, and change the GOTO accordingly, but do not put anything after it!

I did change my version to slash the zero, since this will carry over into a program that is loaded. If you do this, be sure to add a CALL CHAR to the list in line 150!

```
190 CALL CLEAR :: FOR S=1 TO 14 :: CALL COLOR(S,7,16)::
    NEXT S :: CALL COLOR(0,2,16) ::
    CALL CHAR(48,"003A444C546444B8")
```

When you just want to load a program, waiting for it to be read from the disk directory can be a drag. And, you may have trouble recognizing the filename. So, here is the Tigercub Quickloader which I have placed on all my Collection Disks. First you will need Catwriter, another program that writes a program. This one will read the disk directory, ignore everything other than programs, ask you for a complete program name for each filename, and write all that into a MERGE format program called CATMERGE.

```
100 !CATWRITER by Jim Peterson
110 OPEN #1:"DSK1.",INPUT ,RELATIVE,INTERNAL :: INPUT
    #1:N$,A,J,K :: OPEN #2:"DSK1.CATMERGE",VARIABLE 163
    :: LN=1000 :: FN=1100
120 X=X+1 :: INPUT #1:P$,A,J,B :: IF LEN(P$)=0 THEN 160
    :: IF ABS(A)=5 OR ABS(A)=4 AND B=254 THEN 130 ELSE
    X=X-1 :: GOTO 120
130 DISPLAY AT(12,1)ERASE ALL:P$;" PROGRAM NAME?" ::
    ACCEPT AT(14,1)SIZE(25):F$
140 PRINT #2:CHR$(INT(FN/256))&
    CHR$(FN-256*INT(FN/256))&CHR$(147)&CHR$(200)&
    CHR$(LEN(F$))&F$&CHR$(0):: FN=FN+1
150 M$=M$&CHR$(200)&CHR$(LEN(P$))&P$&CHR$(179):: IF
    X<11 THEN 120
160 IF M$="" THEN 180
170 PRINT #2:CHR$(INT(LN/256))&
    CHR$(LN-256*INT(LN/256))&CHR$(147)&
    SEG$(M$,1,LEN(M$)-1)&CHR$(0):: LN=LN+1 :: M$="" ::
    X=0 :: IF LEN(P$)<>0 THEN 120
180 PRINT #2:CHR$(INT(LN/256))&
    CHR$(LN-256*INT(LN/256))&CHR$(147)&CHR$(200)&
    CHR$(3)&"END"&CHR$(0)
190 PRINT #2:CHR$(255)&CHR$(255):: CLOSE #1 :: CLOSE #2
```

Next, key in the Quickloader. Do not change the line numbers, do not RESequence, because CATMERGE will be merged into the middle of it and that last line must be the last. Then, enter MERGE DSK1.CATMERGE and then SAVE DSK1.LOAD .

```
100 CALL CLEAR :: DIM M$(48):: CALL
    CHAR(94,"3C4299A1A199423C"):: CALL SCREEN(2):: FOR
    SET=1 TO 14 :: CALL COLOR(SET,15,1):: NEXT SET ::
    DISPLAY AT(1,4):"TIGERCUB QUICKLOADER"
110 X=X+1 :: READ M$(X):: IF M$(X)<>"END" THEN 110
115 CALL PEEK(8198,A):: IF A<>170 THEN CALL INIT
120 R=3 :: FOR J=1 TO X-1 :: READ X$ :: DISPLAY
    AT(R,1):STR$(J);TAB(4);X$ :: R=R+1 :: IF R<23 THEN
    150
130 DISPLAY AT(24,1):"CHOICE? OR 0 TO CONTINUE 0" ::
    ACCEPT AT(24,26)VALIDATE(DIGIT)SIZE(-2):N
140 IF N<>0 THEN 160 :: R=3
150 NEXT J :: DISPLAY AT(24,1):"CHOICE?" :: ACCEPT
    AT(24,9)VALIDATE(DIGIT):N
160 IF SEG$(M$(N),LEN(M$(N)),1)="*" THEN DISPLAY
    AT(12,1)ERASE ALL:"Return to BASIC": :"Type OLD
    DSK1."&M$(N):: STOP
170 CALL CHARSET :: CALL CLEAR :: CALL SCREEN(8):: CALL
    PEEK(-31952,A,B):: CALL PEEK(A*256+B-65534,A,B)::
    C=A*256+B-65534 :: A$="DSK1."&M$(N):: CALL
    LOAD(C,LEN(A$))
180 FOR J=1 TO LEN(A$):: CALL
    LOAD(C+J,ASC(SEG$(A$,J,1))) :: NEXT J :: CALL
    LOAD(C+J,0):: GOTO 30000
30000 RUN "DSK1.1234567890"
```

If you do not want to give your BASIC-only programs a filename ending in an asterisk, you can leave out that warning routine, or you can modify it to warn of Editor Assembler or Mini Memory programs. If Catwriter has picked up any unloadable program-format files, etc., just delete them from the DATA lines.

The first issue of the GENIAL TRAVeLER has arrived, and it is SUPERB! This is a magazine on a disk, a SS/SD flippy loaded with 700 sectors of some of the finest articles and programs you'll ever see! And the programs are ready to run, you do not have to key anything in. The subscription price, until the end of 1985 at least, is $30 for 6 issues, which computes out to $5 per disk. Many of you are paying your own user group that much for a one-sided disk of public domain!

If the subscribers will only have the guts to refuse to let their friends copy this for free, this venture will surely survive and contribute greatly to the advancement of the TI. The address is - GENIAL COMPUTERWARE, 835 Green Valley Drive, Philadelphia PA 19128.

Gene Burchfield asked if I had a program to print banners vertically. I had never heard of such a thing, so I wrote one.

```
100 DISPLAY AT(12,1)ERASE ALL:"TIGERCUB STREAMER
    PRINTER" !by Jim Peterson
110 DATA 0000,0001,0010,0011,0100,0101,0110,0111,1000,
    1001,1010,1011,1100,1101,1110,1111
120 RESTORE 110 :: DIM B$(16):: FOR J=1 TO 16 :: READ
    B$(J):: NEXT J :: P$(0)=" " :: P$(1)=CHR$(230)
130 INPUT "TEXT TO BE PRINTED? ":T$ :: PRINT :: INPUT
    "PRINTER DESIGNATION? ":PD$ :: OPEN #1:PD$
140 PRINT :: INPUT "SIZE? (1-10) ":Z :: IF Z<1 OR Z>10
    THEN 140
150 FOR J=1 TO LEN(T$):: A=ASC(SEG$(T$,J,1)):: IF A=32
    THEN GOTO 200
160 CALL CHARPAT(A,H$):: FOR W=1 TO 15 STEP 2 ::
    K$=SEG$(H$,W,2):: FOR L=1 TO 2 :: L$=SEG$(K$,L,1)::
    B=POS("0123456789ABCDEF",L$,1)
170 M$=B$(B):: FOR M=1 TO 4 :: N=VAL(SEG$(M$,M,1))::
    N$=N$&RPT$(P$(N),Z):: NEXT M
180 NEXT L :: FOR Q=1 TO Z/2+.5 :: PRINT
    #1:TAB((81-8*Z)/2+.5);N$ :: NEXT Q :: N$="" :: NEXT
    W :: FOR R=1 TO Z/2+.5 :: PRINT #1:"" :: NEXT R
190 NEXT J :: STOP
200 FOR T=1 TO Z*4 :: PRINT #1:"" :: NEXT T :: GOTO 190
210 CALL KEY(0,K,S):: IF S=0 THEN 210 ELSE RETURN
```

If your printer does not have the special characters of the Gemini, substitute 88 instead of 230 in line 120, to print X's, or whatever else you want. If you do have the special characters, try some others, such as 239, for this and other graphics printing programs. This routine will print a handy reference chart of them.

```
100 IMAGE ### #  ### #  ### #  ### #  ### #  ### #
110 P$=RPT$(CHR$(251)&CHR$(253),21):: X=0
120 OPEN #1:"PIO" :: PRINT #1:CHR$(27);"E"
130 PRINT #1:P$:"  ASCII CODES FOR GEMINI SPECIAL
    CHARACTERS":P$
140 FOR J=160 TO 175 :: K=J-X
150 PRINT #1,USING 100:K,CHR$(J),K+16,CHR$(J+16),K+32,
    CHR$(J+32),K+48,CHR$(J+48),K+64,CHR$(J+64),K+80,
    CHR$(J+80) :: NEXT J
160 IF FLAG=1 THEN STOP ELSE FLAG=1 :: PRINT
    #1:"":"":P$:"TI-WRITER CODES FOR GEMINI SPECIAL
    CHARACTERS":P$ :: X=128 :: GOTO 140
```

Another one that just looks pretty -
```
100 !KALEIDOSPRITES by Jim Peterson
110 CALL CLEAR :: FOR CH=100 TO 128 STEP 4 :: FOR L=1
    TO 4 :: RANDOMIZE ::
    X$=SEG$("0018243C425A667E8199A5BDC3DBE7FF",
    INT(16*RND+1)*2-1,2)
120 B$=B$&X$ :: C$=X$&C$ :: NEXT L :: CALL
    CHAR(CH,RPT$(B$&C$,4)):: B$,C$="" :: NEXT CH :: Z=2
    :: CALL SCREEN(5)
130 CALL MAGNIFY(Z):: K=1 :: FOR J=1 TO 7 :: S=96+4*J
    :: R=16*J :: C=100*RND+20
140 IF J>5 AND Z=4 THEN T=5 :: GOTO 160
150 T=INT(15*RND+2):: IF T=5 THEN 150
160 CALL SPRITE(#K,S,T,R,C,#K+1,S,T,177-R,C,#K+2,S,T,R,
    241-C,#K+3,S,T,177-R,241-C):: K=K+4 :: NEXT J
170 Z=INT(2*RND+1)*2 :: GOTO 130
```

```
100 !DISK MATCHER by Jim Peterson
110 DISPLAY AT(8,9)ERASE ALL:"DISK MATCHER": : : :" To
    compare a backup disk":"with a master and list
    any":"files found on one but not"
120 DISPLAY AT(15,1):"on the other.": : : :"
        Press any key"
130 CALL KEY(0,K,S):: IF S=0 THEN 130
140 DISPLAY AT(12,1)ERASE ALL:"INSERT MASTER - PRESS
    ENTER" :: CALL KEY(0,K,S):: IF S=0 THEN 140
150 OPEN #1:"DSK1.",INPUT ,RELATIVE,INTERNAL :: INPUT
    #1:D1$,A,J,K :: DIM F1$(127)    continued on page 28
```

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TC-1. ALLEY CRAPS. Computer displays the dice, fades the shooter, also offers up to four side bets on the roll for point. This one simulates a private crap game rather than the usual Las Vegas table style programs. TCX-1001 in Extended BASIC runs faster than the above, also offers a choice of a friendly game with bets at fair odds or a hustler's game with side bets offered at various odds. Learn to shoot craps the inexpensive way!

TC-3. NUMBER GUESSING GAMES. Offers a choice of 6 different number/letter guessing games - Number?, High-Low, Guess Four, Guessing Computer, Alpha-Better and Tone Tattle. Guess Four is a challenge, the others are good kids' games with educational value. TCX-1003 in Extended BASIC.

TC-4. REVERSO. Restore a scrambled sequence of the 9 digits, by reversing any number of them from the left, while the computer plays its own game and tries to beat you. A new scramble each game, or replay the same scramble to improve your score or as a multi-player game. Challenging and addictive. Now in two skill levels. TCX-1004 in Extended BASIC.

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TC-6. HARE AND TORTOISE. In this colourful version of Aesop's fable, the hare has an even chance of winning. Animated graphics, sound and music. The kiddies love it. TCX-1006 in Extended BASIC.

TC-10. TONE TEST. Identify the higher of two tones which become closer in frequency each time you are correct, then progress automatically to 3, 4 and finally 5 tones which, if you still get them right, eventually rise up the scale to become inaudible. TCX-1010 in Extended BASIC.

TC-11. MUSICAL NOTE RECOGNITION. A simple educational program to learn to recognize the pitch of the notes of the scale. If you guess wrong, it plays both notes for comparison. TCX-1011 in Extended BASIC also shows the notes on a staff.

TC-12. KID STUFF. Offers a choice of translating words or sentences into Pig Latin, Jabberish, or Drawkcab Hsilgne; also includes the Centauran Dictionary, a wristwatch computer program for the commercial space traveller and other star trekkers, to translate the Terran language of English into Centauran, the trade language of the spaceways, also printed in the Centauran alphabet, and with a tonal translation into Standard Robotic! TCX-1012 in Extended BASIC. TCS-512 in BASIC with speech (requires TE II and Speech Synthesizer).

TC-13. PICK UP STICKS. In this colourful version of the old "last stick loses" game, if you keep losing the computer will change the rules to "help" you. With varying numbers of sticks, a very puzzling game if you do not know the secret. Good graphics. TCX-1013 in Extended BASIC (requires Memory Expansion).

TC-14. DRUNKEN SAILOR. Help the sailor from the tavern to his ship through the black of night, leaving a colourful and noisy trail. not easy, because the secret code changes for each game and the sailor staggers unpredictably. TCX-1014 in Extended BASIC.

TC-15. MENTAL MATH PRACTICE. Your choice of addition, subtraction, multiplication or division of 1-digit, 2-digit or 3-digit numbers, with optional setting of optional timer. TCX-1015 in Extended BASIC.

TC-16. FAST ADDITION PRACTICE. Mentally add two 2-digit numbers while the timer gradually cuts your allotted time from 10 seconds for the first problem to three seconds for the last; with a musical salute if you finish all 20 correctly. Definitely not easy! Now includes bonus program DIVQUIZ to practice estimating long division input. TCX-1016 in Extended BASIC.

TC-17. JELLY BEANS. The Republican version of Pac-Man. Guide the Munchie as it scoots around the screen, gobbling up the multicoloured jelly beans - but do not let it eat the licorice! Joystick optional. TCX-1017 in Extended BASIC, much faster.

TC-18. LOST PLANE, lost over the ocean in a storm at night. Guide it home by the beeps on your radar before it runs out of fuel. Graphics, music, 3 skill levels. TCS-518 with speech (requires TE II and Speech Synthesizer).

TC-19. HANGMAN PLUS. Offers 3 levels of difficulty, with a hundred words in each, or a random selection from all 300; or for 2 or more players, input your own word or sentence of up to 4 lines; or load it with a list of words or phrases for someone else to solve. Optional number of tries.

TC-20. SCRAMBLE. Challenges you to unscramble one of 450 5-letter words which can be scrambled into 60,000 combinations, or use your own words. For any number of players and set your own timer. Not too easy, and a good way to improve your spelling and word knowledge.

TC-22. PLANETARY DEFENSE. A space duel in which you are pitted against five unseen alien ships. The computer will help direct your fire toward the closest one. TCX-1022 in Extended BASIC plays faster.

TC-23. ANDROMEDAN INVASION. Another space duel; in this one you must outwit an unseen moving alien ship. Not easy.

TC-25. NERVOUS BREAKDOWN. Try to remember a quick sequence of colours, tones and numbers. You will be surprised at how quickly your memory and concentration improves. In 3 skill levels; very difficult, extremely difficult, and probably

impossible!

TC-26. MEMORY SHARPENER. Try to remember a sequence of letters which increases in length each time you are correct; with 3 levels of difficulty. TCX-1026 in Extended BASIC.

TC-27. QUICK 'N THINK. Another concentration game in which you try to remember the sequence in which a light flashes under the digits 1 to 9. Increases in speed and length as your memory improves, slows down if you need practice. TCX-1027 in Extended BASIC.

TC-29. 3x3 THIN-LINE LETTERS. Will automatically print up to 5 lines of words up to 7 letters long in very attractive enlarged letters. Options for children's learning or display demonstrations.

TC-30. CRYPTOGRAPHY. This program will develop a simple substitution cypher and encode a message of up to nearly 7 lines, or it will accept an encrypted message or cryptogram; then it will help you to solve the cryptogram by printing it out in 3 ways, properly hyphenated, and will display letter substitutions as you direct.

TC-31. KINDERMATH. A kindergarten math teacher to teach addition in optional levels of difficulty; with colour, smiling and frowning faces, tones building to a musical salute for 6 correct answers.

TC-32. BUTTERFLY AND FLOWERS. A colourful game for keyboard or joystick, guide the unpredictably fluttering butterfly to as many flowers as you can before they fade.

TC-33. POT OF GOLD. There is a pot of gold at the end of the rainbow, but it lies beyond a forest of magic trees among which are lurking many terrible dragons which are invisible most of the time. Colourful graphics, 3 skill levels. Kids are crazy about this one. TCX-1033 in Extended BASIC (requires Memory Expansion).

TC-34. RUNAWAY PIG. Chase the scampering, dodging pig back into his pen before he escapes through the holes in the fence, then slam the gate quickly! A fast action game with 3 skill levels - City Dude, Farm Boy, and Pig Farmer. Joystick optional. TCX-1034 in Extended BASIC.

TC-35. SUBMARINE HUNT. Track the Nazi submarine by sonar, maneuver your destroyer over it, then drop your depth charges, but do not let it get too far away or it will fire its torpedoes at you. A fascinating game. TCS-535 with speech (requires TE II and Speech Synthesizer). TCX-1035 in Extended BASIC.

TC-36. SIMON SAYS. Follow Simon's moves quickly if Simon "says" with a beep but otherwise do not move! Colourful and noisy, with 4 levels of difficulty from the kiddies' "Simple Simon" to the nearly impossible "Super Simon". TCX-1036 in Extended BASIC.

TC-37. PILLBOX AND TANKS. 150 enemy tanks are charging toward your front lines and you have 100 shots to get as many as possible - but do not let them crash into your pillbox! A simple but very addictive game.

TC-38. RITHMATIK. Identify a random 4-digit number from only 3 clues. Two levels. A good high-school level math quiz game, not all that easy. Now also includes MULTQUIZ to practice mental multiplication. TCX-1038 in Extended BASIC.

TC-39. WHITEWATER RUN. Guide your raft down Whitewater Canyon, stay away from the rocks and try to avoid the dangerous whitewater. A fast action game with 7 skill levels. TCX-1039 in Extended BASIC, very fast. One of my best!

TC-40. WAWALAND. A bad dream in which you are lost in the wilds of Wawaland, surrounded by wiffles converging on you. You can escape by tricking the wiffles into bumping into the winka trees or into each other - or you can just wake up! Two levels, for kids and grown-up kids. The youngsters love this one because they never have to lose. TCS-540 with speech (requires TE II , Speech Synthesizer). TCX-1040 in Extended BASIC.

TC-41. LONG DIVISION CRYPTOGRAMS. Prints out a random long division problem in the proper format, with letters substituted for the numbers, then helps you to solve the puzzle by making substitutions or calculations as you direct. Will keep you up all night! TCX-1041 in Extended BASIC.

TC-42. FLASH CARD SPELLING. A simple educational program which accepts spelling lists either by INPUT or DATA statements, flashes the words in sequence to be spelled; requires errors to be corrected, also repeats misspelled words at end of lesson.

TC-43. MISS SPELL. Miss Ophelia Spell has a word list of 200 words, each in a correct and an incorrect spelling. Displays 20 words of a selected lesson in sequence, each randomly correct or misspelled. Student decides if word is spelled correctly and, if not, spells it. Errors are repeated at end of lesson. Option to input your own words. TCX-1043 in Extended BASIC, requires Memory Expansion.

TC-44. SCRAMBULATION. For two players who take turns typing in phrases for the other to solve. The computer scrambles the letters in each word, in Level 2 also scrambles the sequence of words, but gives help if requested. TCX-1044 in Extended BASIC.

TC-45. TIRKLE. The TI99/4A version of Hurkle, a simple but very entertaining game that will help children learn compass directions and logic.

TC-46. MISSIONARIES AND CANNIBALS. A computerized version of this old brain-teaser, complete with missionary music. Help the missionaries get across the river without being eaten.

TC-47. BARGRAFFER. Will display a vertical bar graph of up to 28 functions, in 8 colours, as accurately as 1/8 of a print space allows, and with optional display of titles and percentages. Very compactly programmed, useful as a utility in business programs. TCX-1047 in Extended BASIC, 6 colours.

TC-49. TUNEPICKER. Even if you know absolutely nothing about music, this program will help you to compose and save your own tunes.

TC-50. SQUINCH. A different kind of word game for 1 to several players; separate two words which have been intermingled into one. With word list of 200, millions of possible combinations, optional timer. TCX1050.   o

```
160 X=X+1 :: INPUT #1:F1$(X),A,J,B :: IF LEN(F1$(X))<>0
    THEN 160 ELSE CLOSE #1
170 DISPLAY AT(12,1)ERASE ALL:"INSERT BACKUP DISK":
    :"PRESS ENTER" :: CALL KEY(0,K,S):: IF S=0 THEN 170
180 OPEN #1:"DSK1.",INPUT,RELATIVE,INTERNAL :: INPUT
    #1:D2$,A,J,K :: DIM F2$(127)
190 Y=Y+1 :: INPUT #1:F2$(Y),A,J,B :: IF LEN(F2$(Y))<>0
    THEN 190 ELSE CLOSE #1 200 DIM F(127):: FOR J=1 TO
    X :: FOR L=1 TO Y :: IF F2$(L)=F1$(J)THEN F(L)=1 ::
    GOTO 220
210 NEXT L :: PRINT F1$(J);" NOT ON BACKUP"
220 NEXT J
230 FOR M=1 TO Y :: IF F(M)=0 THEN PRINT F2$(M);" NOT
    ON MASTER"
240 NEXT M :: END
```

A very useful tip from Jim Swedlow, in the Orange County ROM newsletter: INPUT respects any trailing print separator on a preceding PRINT command. Try it.

```
100 PRINT TAB(20);::: INPUT B$                        o
```

Kaleidawriter Data-Bank

by Colin Cartwright, ATICC Adelaide

This subject may help to satisfy some curiosity and create a lot of disbelief. Once again, problem, where do I begin?.

What I am currently working on is a device that I call Kaleidawriter Data-Bank, which with a bit of luck is only the beginning of the Kaleidawriter family. It all began about 9 years ago when I designed a device which would let me draw all over my TV screen, and due to lack of finance and many other problems I made one and then decided to shelve the project. Well since then it has been dragged out from time to time and modified and shelved again. Well to cut a short story short it was a year ago when it raised its ugly head again. I say ugly because it had undergone so many changes that I had more bugs in it than a light bulb gets around it on a hot summer's night.

Well once again it was seen by a few more people, Fred (Cugley) being one of them. I am not going to tell you all the things that it did or all the things that it would not do anymore, because part one of it did not work, but never the less I showed the little bit that it could do and the photographic record of some of the things that it did do.

Interest bloomed again! I am now sure that I must be totally MAD! Anyone that sits up until 2am nearly every morning working on the damn thing must be. Well that is how I felt for quite a while but now things are starting to come together.

Let me step back one step for a moment. I am not sure how it happened but someone had the bright idea that the device would be easier to get off the ground if it was adapted to aid a computer. Well being an ex employee of Texas Instruments in their so called electronics department and being in possession (has not that word got a lot of s's?) of a TI99/4A, it became the obvious choice, and after many sleepless nights I now know what it will do and will not do for the TI99/4A. Mind you when I started this project I think that I may have used my TI99/4A maybe three or four times only. It was then that I came to the conclusion that the TI99/4A needed all the help that it could get. For example, all other current computers that are on the market had so much more back up and what appeared to be better graphics and programs.

At first I figured that maybe I should be designing the Data-Bank around a Commodore (sorry about this bad language!) but due to the fact that all my spare money was going into renovation of my home, I had to settle for the TI99/4A. Now that I have you in suspense long enough I will get to the punch line. What will Data-Bank do for you?.

"It is an intelligent life form" that will allow you to run all those fancy programs that you see on computers that have cost their owners a small fortune.

The reason that Fred has not given much information out about Data-Bank prior to this is that I was not prepared to make any claims about Data-Bank until I had proven its bug free operation to myself. I did not want to be in a position of making claims only on theory. From my last statement you can work out for yourself why it has taken so long.

I have proven that it is better to have something that you can receive straight after you have paid out for it. There is nothing worse than waiting on a delayed order due to a bug in a system that was not thought out thoroughly prior to sale.

Kaleidawriter Data-Bank is not yet available, but it will not be much longer, hopefully early next year (1989). Now that I have finished most of the design, proven and tested it I now have the task of trying to work out which functions to make standard and what to offer as optional extras. For example, it will be able, if you have every option, to run IBM, Amstrad, Commodore, Amiga, and MSX software via the TI99/4A console. It will also have a direct monitor interface for fourty or eighty columns. It will be able to do all the things that GRAMcracker did plus. Most common TI99/4A software will be resident, no more waiting to load.

It will give the TI99/4A massive speed increase without loss of usability of any software. There will also be a wide selection of Kaleidawriter software for your enjoyment. Each Kaleidawriter Module will allow memory expansion up to 5 Mbyte. When I say each module, I am letting you know that there is a lot more on the drawing board.

Do not say I did not warn you about disbelief, but there is more! Getting harder to believe yet? The price! At this point of time that has not been totally settled. As I said before, it depends on what is resident and what is optional, but I can say it will be much less than buying even one of the other computers mentioned. Every so often I read back to myself what I have written so far and I sound like a Mid-Dawn TV commercial. You will have to excuse me but I tend to get a bit exited as I get closer to completion.

There is more that I could tell you but I do not want to give away all my cards at this point of time. Hoping that this has whet your appetite .

Well I hope all of you TI99ers out there are faithful to your machines as Kaleidawriter Data-Bank will compliment any computer that I choose to configure. What I am trying to explain is that without your support in quantity, Data-Bank is not a viable proposition. That is all about Data-Bank for now and I will keep you up to date.

A special thanks to those who have assisted me throughout the past year, especially Fred Cugley for his constant support and help in one way or another, and also to the help given by Alister Dick. Thanks guys.   o

Power supply for Hard Disk   LA/GT 6/3/89
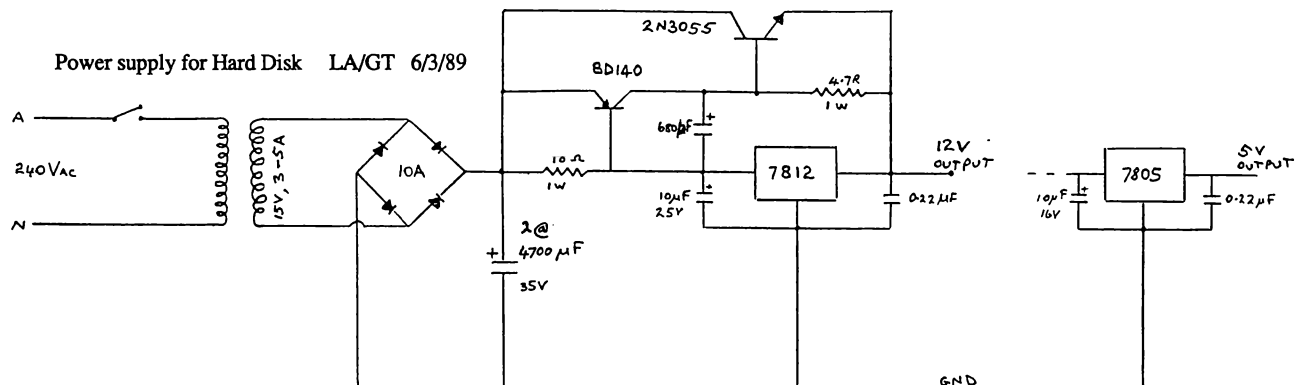
As I have reported in this issue, thanks to John Vandermey I am operating a hard disk for my editing duties and, as expected, it has proved to be extremely useful and helped my productivity considerably. I estimate that it has reduced the time spent editing by about a third. I have set up several subdirectories, one of which I called DSK1 into which I have loaded the latest Funnelweb system (version 4.13) and use this to run the Myarc DM5, Spelling Checker, Editor and Formatter. I then have 3 other directories called R (rough), E (edited) and P (printed or formatted). I have also an emulation of DSK1 file which is a DSDD emulation and allows access to files as if it was a floppy drive. This means I can load files into this and use all the software capabilities of things like SD from the Editor or Disk Utilities to change information on the sectors. I have a floppy disk (courtesy of John Paine) on the system connected as DSK1 and DSK2. The HDFC looks in the emulated DSK1 first and then into WDS1.DSK1 and finally at the DSK1 floppy. If I actually want the floppy I can use DSK2. I first put the files into the R directory and spell check them into the E directory. Then they are edited and the format commands inserted and formatted into the P directory. This means I can use the Funnelweb post box system to examine the formatted results and only need to change one letter, the directory name (P or E), to load the formatted file or to reload the original file. And of course with the hard disk it all takes only a few seconds. This means I can be reasonably sure that I have things in good shape before printing them instead of finding the problems after the printing and having to print them again. I am also using a Mechatronics 80 column card (courtesy of Ben? or is it Rolf?) and a Taxan colour monitor. I will write a bit more about that for next month, but it is a real treat to have an 80 column Editor and it has contributed to the estimated productivity increase in its own way. I am indebted to Tony McGovern for providing his excellent version of TI-Writer adapted for use with the 9938 VDP chip which is the chip in the Mechatronic, Dijit and Geneve. We have not seen a Dijit card but can verify the fact that the software works well on the Mechatronic and the Geneve.

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Lou, Rolf and I wrote to Tony McGovern enclosing a suitable donation for the use of the Funnelweb system. I also asked Tony if he could look at a couple of problems that I had with the system. First, I found that the Editor would not Print File to RS232/3 or RS232/4 whereas the formatter was quite happy with these. I think Multiplan also has problems in this direction. The other problem was that the hard disk file names would not remain in the postbox and the SD command did not know about the hard disk. I also had heard about the 80 column version of the Editor and was keen to try it out as the Mechatronic version is not too good. Tony wrote back to me and sent the latest version (4.13) and the AVPC version of the Editor (archived). He had fixed the postbox problem and had started thinking about the RS232 problem but did not have a reasonable solution. Unfortunately the archiving had gone wrong and we were not able to get the 80 column version of the Editor so I sent the disk back to Tony explaining the problems. It turned out that the only copy he had kept was an archived version which was also corrupted. He managed to get a copy from someone else and sent me a correct version both archived and unarchived. In the meantime he had worked out where the RS232 problem arose and has fixed that too. All I can say is that the 80 column Editor is just great and a real credit to Tony. I have suggested that the club send a complimentary copy of TND to Tony in recognition of his great service to our present and future. Thank you very much, Tony, from me for such prompt replies to my letters.

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Does anyone know anything about the GIF format for picture files? Tony would like to write a display program like MYART1 (for the Geneve) for the TI99/4A as there are a whole lot of pictures available in this format. If you can provide any information drop me a line on the BBS or via the secretary. I also had a nice letter from C. McKay thanking us for a timely (as far as he/she was concerned) article on configuring Funnelweb. I must admit that although I have been through the configure operation several times I still find that I am looking for help some of the time, especially when setting up the XB and UL menus. However trial and error usually gets me through. Did you know that the DISK UTILS menu on the TI-Writer menu is a UL menu and can be changed through the configure program? Try fetching the DS and CP lists. ○

Newsletter Update

by Lou Amadio

Local Newsletters

TIBUG Bug Bytes - Feb 1989: Lament by editor about lack of contributions for newsletter (do we have this problem, Geoff?), Garry Christensen now has his hard disk working, interlace of 3 (during formatting) allows a faster access time for the TI disk controller, Funnelweb V4.13 is out, review of Myarc DM5 for hard disks, Living With Spiders Assembly tutorial part 1 by Tony McGovern.

Melbourne Times - Jan 1989: Review of Disk labeller 99, Multiplan tutorial by Peter Gleed, advantages of getting involved in the hardware as well as the software, prediction that voice recognition will come and report on the Chicago Faire.

Overseas Newsletters

Edmonton 99er Computer Users - April 1988: Miscellaneous club information as well as article on 2D arrays. May 1988: Articles on replacing noisy PE box fan and a LOAD interrupt switch. Sept 1989: TI-Writer refinements and "fixing" the Formatter to use @, & and ...., home security with remote controllers and TI99/4A power requirements. Oct 1988: Miscellaneous club information and article on static prevention by connecting the (metal) console to the PE box via a 5Meg resistor.

Northern NJ 99ers - Feb 1989: Creating a data base using TI-Writer, a maze maker program and a very interesting article by Charles Hood on an Automatic Cassette Tape Program Location System.

LA99ers TopIcs - Jan 1898: The Power of AND by Graig Miller, Bill Gaskill's Random ramblings about the best TI99/4A programs currently about, mention of an article on orphaned computers in PC Computing magazine (Dec 88, page 22) titled "Gone But Not Forgotten" with information on the largest user groups, how to transfer PRBase files by "printing" to a data file, dead Mini Memory battery will make the module unusable unless the battery is removed or replaced and a FORTH tutorial on graphics by Earl Raguse.

PUG Peripheral - Feb 1989: Club designed "Zeno Board" to relocate 32K, clock, Extended BASIC, speech and a parallel port inside the console, NX1000 ROM upgrade (V1.5 LFTI) to prevent unnecessary paper feed, TI Artist for Beginners, Forth, TI-Writer and Multiplan tutorials, continuation of "Disk Drives" #6 by John Willford and how to use TTL chips to replace PAL chips on TI PCBs.

ROM Newsletter (Orange County) - Jan 1989: Suggestion for Software Of The Year award, assembly shell sort linked to Extended BASIC by Adrian Robinson, TI-Writer Margins, BASIC cheque book program, a FORTH tutorial and an article on "Copyright" for programmers.

TI FOCUS Channel 99 Users - Feb 1989: Review of Disk labeller 99, TI-Base V2.0, TI-Writer and Multiplan tutorials and a warning by a sorry user on waiting 2 minutes before inserting or removing PE box cards. ○

Regional Group Reports

Meeting summary.

Banana Coast	9/04/89	Sawtell
Carlingford	19/04/89	Carlingford
Central Coast	8/04/89	Toukley
Glebe	13/04/89	Glebe
Illawarra	16/04/89	Keiraville
Liverpool	7/04/89	Northmead
Northern Suburbs	27/04/89	Davidson
Sutherland	21/04/89	Jannali

BANANA COAST Regional Group
(Coffs Harbour area)

Regular meetings are held in the Sawtell Tennis Club on the second Sunday of the month at 2 pm sharp. For information on meetings of the Banana Coast group, contact Kevin Cox at 7 Dewing Close, Bayldon, telephone (066)53 2649, or John Ryan of Mullaway via the BBS, user name SARA, or telephone (066)54 1451.

Banana Coast Meeting report-:

Members of our group express their support for the Directors of the New Board and leaders of Sub-committees appointed, especially the Editor Assembler of our mainstay TIsHUG News Digest. We were delighted to learn that Rolf and Geoff were to get a game this season!

Terry and Russell are well known to us and we thank them for standing again, we need men of experience in their field of endeavour to carry out routine but often laborious functions unheralded.

Welcome to Dick Warburton and Robert Peverill, we expect to hear more from them during their term of office. It was refreshing to read Dick's announcement on the BBS so soon after taking the Chair.

Stephen and Lou are no strangers to our avid readers of TND and we look forward to having some dealings with them in the near future. Hardware being a bit of a problem at times in our isolation.

Our heartiest congratulations to the recipients of Certificates of Merit Vincent Maker and Ross Mudie. The Banana Coast Group have understandably a special regard for Ross Mudie and Geoff Trott who play a major part in their TI99/4A lives. We extend our support for their nomination and acceptance as Life Members.

CARLINGFORD Regional Group.

Regular meetings are normally on the third Wednesday of each month at 7.30pm. Contact Chris Buttner, 79 Jenkins Rd, Carlingford, (02)871 7753, for more information.

CENTRAL COAST Regional Group.

Regular meetings are normally held on the second Saturday of each month, 6.30pm at the Toukley Tennis Club hall, Header St, Toukley. Contact Russell Welham (043)92 4000

GLEBE Regional Group.

Regular meetings are normally on the Thursday evening following the first Saturday of the month, at 8pm at 43 Boyce St, Glebe. Contact Mike Slattery, (02)692 0559.

ILLAWARRA Regional Group.

Regular meetings are normally on the third Monday of each month, except January, at 7.30pm, Keiraville Public School, Gipps Rd, Keiraville, opposite the Keiraville shopping centre. Contact Lou Amadio on (042)28 4906 for more information.

LIVERPOOL Regional Group

Regular meeting date is the Friday following the TIsHUG Sydney meeting at 7.30 pm. Contact Larry Saunders (02)644 7377 (home) or (02)759 8441 (work) for more information.

All demonstration programs are subject to Air Mail from USA. Some are still on the way ** ALL WELCOME **

Press has a 2-10 Weeks or more delay from Asgard as at 25th February 1989

April Meeting, 7th April. Demonstrations of P-Gram card, Beyond Video Chess, Typewriter, Batch-It and Press (perhaps). The meeting will be at Cyril Bohlsen's house, 4 Madelaine Street, Northmead, phone (02)639 5847.

May Meeting. Demonstrations of Tod Editor, Legends II, PrEditor update, Press (perhaps) and Telco 3.0 (perhaps).

June Meeting, 9th June. Demonstrations of complete TI-Artist collection of Fonts, Instances, Borders, Enlarger and perhaps Press.

July Meeting, 7th July. Demonstrations of Font Writer II, Old Dark Caves, Oliver's Twist, Grand RAM card and Press in 80 columns.

NORTHERN SUBURBS Regional Group.

Regular meetings are held on the fourth Thursday of the month. If you want any information please ring Dennis Norman on (02)452 3920, or Dick Warburton on (02)918 8132.

April meeting, 27th April. Demonstrations of merging Picasso and TI-Writer files. At denis Norman's house, 24 Woolrych Crescent, Davidson, phone 452 3920.

May meeting, 25th May. Demonstrations on using Disk Utilities. At Chris Develin's house, 17 Lowana Street, Belrose, phone 451 9982.

June meeting, 22nd June. Demonstrations of Funnelweb Configure and loaders. At Craig Sheehan's house, 21 Suzanne Road, Mona Vale, phone 997 1293.

Come and join in our fun. Dick Warburton.

SUTHERLAND Regional Group.

Regular meetings are held on the third Friday of each month at the home of Peter Young at Jannali at 7.30pm. Group co-ordinator is Peter Young, (02) 528 8775. BBS Contact is Gary Wilson, user name VK2YGW on this BBS.

Current topics of interest include Multiplan and TI-Base.

Due to a prior commitment, my Birthday, I was unable to attend the Annual General Meeting for TIsHUG in February. I had very little choice regarding my date of birth.

Thanks to those members who have again taken on official positions within the Group and to those new Executive members, good luck.

The Sutherland Regional Group continues to thrive, with a small but enthusiastic membership. Peter Young

TIsHUG in Sydney

Monthly meetings start promptly at 1.30pm on the first Saturday of the month that is not part of a long weekend. They are held at the Woodstock Community Centre, Church street, Burwood. Regular items include news from the directors, the publications library, the shop, and demonstrations of monthly software. Meetings for the next couple of months are:

April 1 - Unfortunately, a delay of up to twelve weeks is expected in the shipping of "Press". In place of a display of this program, a tutorial on using PRBase and TI-Base will be held, in two separate groups. In addition to this, the TI-Artist special interest group will meet.

May 6 - TIsHUG's technical co-ordinator will exhibit some of the technical projects shown in the TND over the past twelve months. These will include a modified console with 32K on the 16 bit bus, the Super Module and a step down transformer for the PE box. Being the club's 8th birthday, a demonstration of TI99/4A hardware, past and present will be given. If you wish to contribute to this display, please ring Craig Sheehan on (02) 997 1293 on weekdays after 8pm.